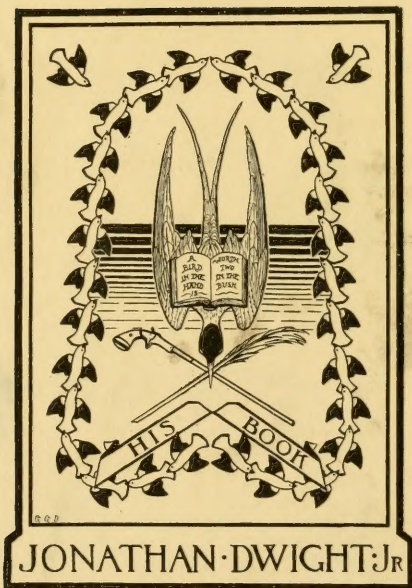


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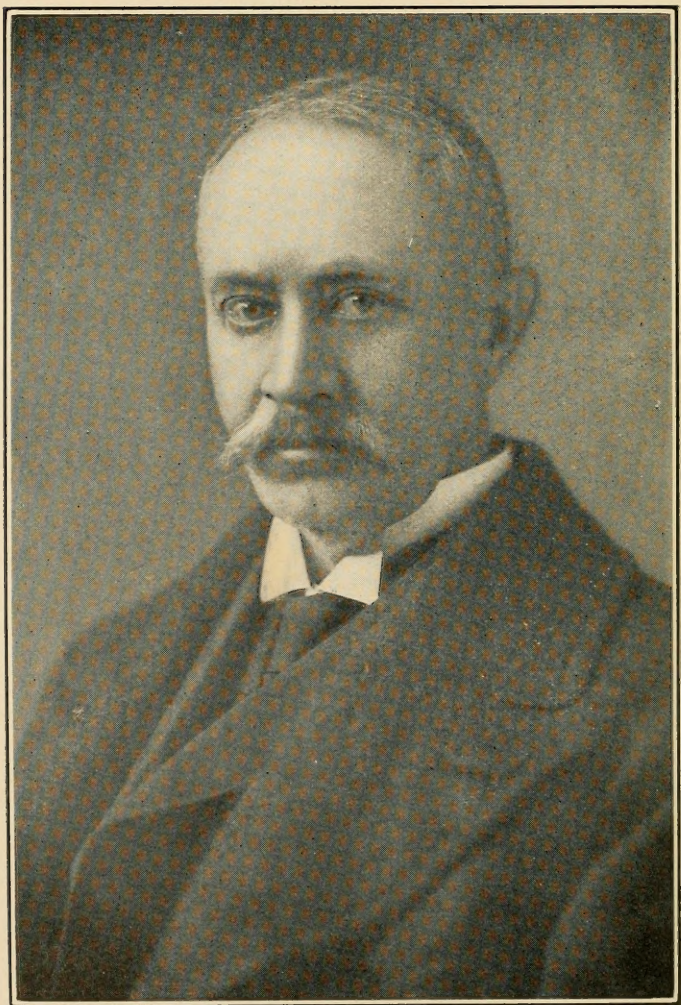
and Waders

Dwight W. Huntington



R.W. Thurpeest, M.D.
Washington D.C.

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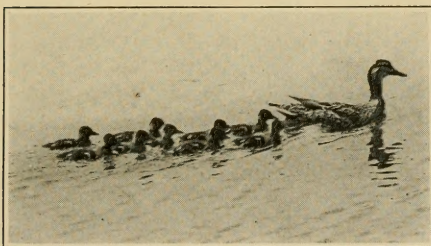
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OUR WILD FOWL AND WADERS

BY
J. J. WILLIAMS
DWIGHT W. HUNTINGTON

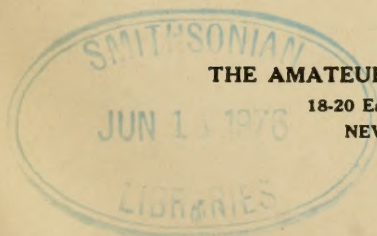
(Author of *Our Feathered Game*; *Our Big Game*, and Editor
of *The Amateur Sportsman*.)



WITH TWENTY-FOUR FULL PAGE ILLUSTRATIONS AND
A MAP OF THE WILD DUCKS' BREEDING GROUNDS

THE AMATEUR SPORTSMAN CO.

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MALLARDS IN AUGUST
The Author Views Them Over the Gamekeeper's Gun

I

INTRODUCTION

THIS is the first book written for American readers on the practical conservation of game. It deals with the methods of propagation and preservation which are essential to make game abundant and to keep it plentiful in places where field sports are permitted. It is entirely different in plan and purpose from my earlier books.

All of the American works on field sports describe the various methods of pursuit and destruction; although they contain, usually, something about the habitat, breeding and food habits, and migration of game, they are silent about the practical and profitable methods of increasing its numbers. The same may be said about our ornithologies and books on natural history. The writers often deplore the fact that the game birds are vanishing; they have insisted upon the enactment of many laws restricting sport, but they overlook the fact that such laws prevent the increase of game by breeders. There is a disposition throughout the country to remedy this mistake, and the game laws have been amended in some States so as to encourage the profitable breeding of game.

Elliot, referring to the incessant persecution of the

birds, in his "Wild Fowl of North America," says: "Although it is apparent to all save those who will not see, that only a brief period can elapse, if the same conditions continue, before, like the buffalo, our water fowl will mostly disappear, yet little is done to save them from destruction, and the ruthless slaughter goes gaily on." There can be no doubt that laws restricting and even prohibiting sport are necessary in places where no one looks after the game properly. Such laws have delayed, somewhat, the extirpation of the game, but the fact remains that many species have not increased in numbers or even held their own in populous regions since the enactment of the restrictive laws, and no one can claim that such legislation will restore our indigenous wild food birds or keep them abundant in our markets. One reason is that the laws cannot be properly executed. The area to be policed is too big. Mr. L. T. Carleton, of Maine, one of the best State game officers, has well said that the entire State militia would be inadequate to properly protect the game. But even if it were possible to execute the game laws, there are good reasons why they would not save the wild fowl. In settled regions the nesting and feeding grounds of the ducks have been destroyed, and in the Far North the marshes are now being drained.

One of the chief causes for the decrease in the numbers of our wild ducks is undoubtedly the draining of the marshes and the destruction of their breeding and feeding grounds. Nearly all of the desirable ducks which are shot in the United States east of the Rocky Mountains are bred in a comparatively small area, which may be described roughly as including parts of Wisconsin, Minnesota and North Dakota and parts of the Canadian



The Wild Ducks Paradise

Within the area included in the dotted line the greater part of the wild ducks which are shot in all of the States East of the Rocky mountains are bred. The natural conditions within this area are changing rapidly. The marshes are being drained. Cities, like Winnipeg, Regina and Edmonton have been founded and have grown rapidly. Sportsmen will find here a cause for the continued reduction in the numbers of the ducks.

The breeding grounds are being destroyed

A few years ago the breeding area extended Southward as indicated by the line

Provinces, north of North Dakota, and as far west as Alberta.

This region has been named "the ducks' paradise." Millions of ducks are hatched in this region, although their numbers have decreased much and the breeding area has been much reduced, especially within the United States.

Mr. Wells W. Cooke, of the United States Biological Survey, an authority on the migration of birds, says: "The prairie districts of Central Canada, comprising large portions of Manitoba, Saskatchewan and Alberta, are 'the ducks' paradise.' Within the United States this favored region extends to the North Eastern part of Montana, the Northern half of North Dakota and the North Western corner of Minnesota. The whole vast region is crowded with lakes, ponds, sloughs and marshes that furnish ideal nesting conditions and unlimited food. Forty years ago every available nook was crowded with water fowl, and the whole region, 200 miles wide by 400 miles in length, was a great breeding colony and numbered its inhabitants by the hundreds of thousands."

The building of the Northern Pacific Railway across the Southern boundary of "the ducks' paradise" was followed by the building of the Canadian Pacific Railway through the center of it, and, as Mr. Cooke well says, it is evident that in the United States and Southern Canada in a few years there will be no great breeding colonies of the ducks most valued for sport and for the table. Edmonton, Alberta, a growing city of over 20,000 inhabitants, is about in the center of the breeding ground for canvas backs and other desirable ducks, and other

cities and towns in the paradise are increasing in population rapidly.

This matter is of the utmost importance to all duck shooters East of the Rocky Mountains, since the ducks which are shot throughout this portion of the United States must come, for the most part, from the breeding grounds above described. The duck clubs in the Mississippi valley and about the great lakes and on the Atlantic coast, from New Jersey to Florida, should be much interested in the preservation of "the ducks' paradise," since when this is destroyed the shooting on the club marshes will be sadly lessened and the splendid properties of the clubs must decrease in value accordingly. How to prevent the destruction of the breeding grounds is one of the most important problems for the duck shooters. Some big parks or refuges for ducks should be established in this region, and the inhabitants should be taught to save some of the breeding grounds, which they own, because it will pay better to do so than to drain them. It is evident that laws prohibiting the shooting on certain days of the week and limiting the open season and the size of the bag can only delay the extirpation of the ducks; they do not govern the most important matter—the preservation of the breeding grounds. This can only be accomplished in the ways I have pointed out. We should remember, always, that restrictive laws of the character just mentioned make it not worth while for the land owners to save the marshes and the fowl. No one can be expected to do anything which does not pay.

The wild ducks which migrate up and down the Pacific coast are hatched, for the most part, North of the

United States as far North as Alaska. Parks, or breeding reservations, in the Western ducks' paradise should be created, where the birds can find safe nesting places for all time to come.

Individuals and clubs should rear many of the most desirable ducks locally, so that they can have excellent shooting before the migratory ducks arrive from the North. The markets in this way should be kept full of wild ducks during a long open season at prices surprisingly small.

No game can survive when its breeding places are destroyed, unless other breeding places are provided, no matter how many laws may be made for its protection. The time has arrived to encourage the propagation of game and to make it worth while to preserve suitable places for its profitable increase.

It was only a few years ago that the discovery was made in England that the wild duck could be preserved and made abundant for sport and for profit by the hand-rearing process, which was known to work well with pheasants and other game. Prior to this important discovery every one thought that the wild duck was too wild to be handled successfully and that any attempt to preserve it would result in producing sport for others and not for those who reared the ducks. Some simple experiments, however, made by gamekeepers proved the contrary to be true, and in a very few years after the experiments were made nearly every small water in England had its wild ducks. Scores of English wild duck farmers now make a good living by selling their ducks and eggs. Many individuals and clubs, or syndicates, as they say in England, also rear thousands of ducks for

sport, many of which are sent to market, and the English wild fowlers, or market gunners, are busy on the public waters for six months in the year with no fear of extirpating the game.

More than ten thousand ducks were reared in a season at Netherby Hall, and the skilled gamekeeper who achieved this remarkable success proved that big bags of ducks can be shot safely every season.

The late Rutherford Stuyvesant introduced the new sport to America, and he was fortunate in securing the services of George Edgar, the keeper who had made the wild fowl abundant at Netherby. Ducks and eggs were imported from England and within the year, after the start was made, several thousand mallards and other fowl were reared about some artificial ponds on the Stuyvesant farm in New Jersey. Those who were invited to shoot were enthusiastic in praising the new sport.

In addition to the birds which were shot, the gamekeeper produced many ducks and eggs which were sold to other duck rearers in New York and New Jersey and as far south as Virginia. Wild ducks are now reared on many game farms and afford splendid sport to many guns.

Upon the untimely death of Mr. Stuyvesant, Mr. Edgar went to another country place in New Jersey, whose owner had purchased some of his ducks and eggs, and although the season was late when he started, he succeeded in rearing this year several thousand mallards, besides a big lot of pheasants and a few guinea hens, which, by the way, fly nicely and soon may be added to our game bird list.

I have made some experiments with several species of wild ducks by which I ascertained that it is an easy matter to increase their numbers in places where they are properly looked after. Often I have visited Mr. Edgar and other gamekeepers in order to study their methods of breeding wild fowl, and much of the material for this book was procured on American game farms and preserves.

I am indebted also to the writers of the English books, to whom I have given credit, and to the writers of numerous articles which have appeared from time to time in the English magazines since the discovery was made that the wild fowl can be preserved. The breeding of wild ducks should interest the farmers as well as the sportsmen, since many small swamps and waste places can be utilized for profit as well as for sport. Many species of ducks are excellent food, and I have no hesitation in predicting that the best wild ducks soon will be abundant and cheap in our markets. The sportsmen who are willing to do something practical should have excellent shooting during a long open season, and it is evident that those who do nothing will be benefitted when the game becomes plentiful, since the game overflows from all places where it is abundant.

Although the shore birds, or waders, do not lend themselves to the gamekeepers' art of hand-rearing, they have been found to respond nicely to the protection given to the ducks, and they increase in numbers rapidly when safe nesting and feeding places are provided for them. I have observed the woodcock, snipe, and other waders breeding abundantly on duck preserves where gamekeepers are employed to control the natural enemies of

game, and those who undertake to preserve the wild duck will do well to provide suitable nesting and feeding places for these desirable food birds and to extend to them the same practical protection from their natural enemies which is given to the ducks.

II

DUCKS, GEESE AND SWANS

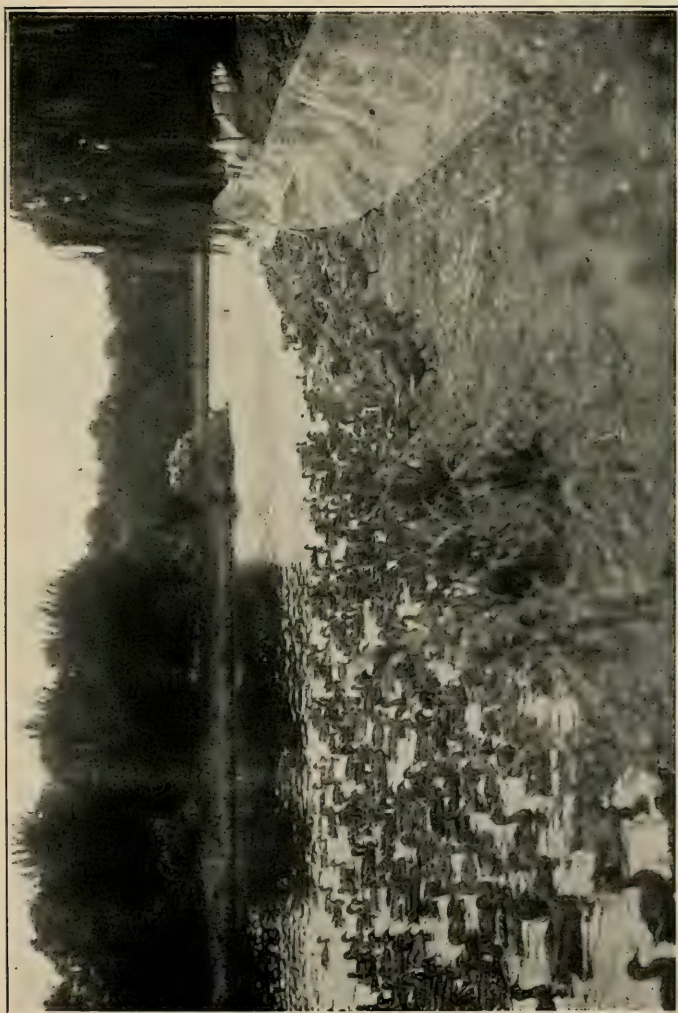
THERE are sixty-four species of ducks, geese and swans in North America north of Mexico. All of these birds are described and pictured in my book, "Our Feathered Game." Twenty-four species breed in the United States. Aside from the aesthetic value of the birds many of them are valuable as food and are accordingly legitimate objects of pursuit. The ducks are classified by the ornithologists as sea ducks, or divers, and fresh water ducks, or dabblers. Many species of the sea ducks are not very desirable as food on account of the fishy, or sedgy, character of their flesh, but all of the fresh water ducks are palatable and nutritious and well worth preserving.

Among the sea ducks, the famous canvas back, the redhead, the two scaups (black heads or bluebills), the golden-eye, buffle head and ruddy duck are the most valuable. The fresh water ducks are the mallard, dusky or black duck, the blue-winged, green-winged and cinnamon teal, the shoveller, widgeon, sprig-tail, gadwall, and wood-duck.

Although the sea ducks nest in some of the Northern States and much can be done in the way of protecting them when breeding wild in places where their natural

foods are abundant, they are not so easily domesticated or handled on game preserves as the fresh water ducks are. It may be when game keeping becomes common in the United States that the more valuable species of sea ducks will be hand-reared as the mallards and some of the other fresh water ducks now are. Since the canvas backs and redheads command high prices in the markets and are highly prized by sportsmen, the game farmer or game preserver who can successfully multiply them will find the industry profitable, and some interesting experiments with these birds could be made in Wisconsin, Minnesota and North Dakota and in other States as far west as Oregon and in the Canadian Provinces in localities where the wild celery and wapato and other natural foods of these ducks are abundant. Many sea ducks undoubtedly can be induced to nest in a wild state beside safe and attractive waters, and they should increase in numbers rapidly in places where they are properly looked after and where their natural enemies are closely controlled.

The mallard undoubtedly is the best duck for the game preserve where hand-rearing is carried on, and the mallards are by far the most abundant of all fowl on the English preserves. The dusky duck, often called the black mallard, has been domesticated in many places in America, and it should be reared on preserves quite as easily as the mallard is. In England the teal, sprig-tail and widgeon have been successfully propagated by gamekeepers, and all of the river ducks can be made abundant, without doubt, on American preserves where gamekeepers are employed. Since the wood-duck nests in trees, suitable nesting places should be provided for



YOUNG MALLARDS GOING TO FEEDING GROUND

them. They have been domesticated in many places and often breed in parks and zoological gardens, and both the ducks and their eggs can be procured from American game farmers.

A mixed bag is attractive and desirable, and the game preservers, no doubt, will successfully rear most, if not all, of the fresh water ducks when game preserving becomes common. The English teal, which has been successfully bred on preserves, and some of the other English ducks probably can be introduced to advantage and made abundant on American game farms and preserves. Many English game farmers have both the birds and their eggs for sale in large numbers.

The wild geese for the most part breed in the far North, and it seems doubtful if many species could be handled on the preserves in the United States. The Canada, or common wild goose, has been domesticated in many of the States, and undoubtedly it can be reared in large numbers on many preserves and game farms for sport and for profit. ¹Mr. Whealton, of Chincoteague Island, Virginia, is a very successful breeder of Canada geese and can supply birds and eggs in large numbers.

The swans are very ornamental birds and often are seen in parks and zoological gardens, but it seems doubtful if they ever will be bred for sport on the preserves.

My own experiments with wild ducks were confined to the mallards and dusky ducks, but I have seen several other species breeding on game farms and preserves in America. The methods of making the breeding grounds safe and attractive and of controlling the natural enemies of the wild ducks, which are described in the following pages, are applicable to all species of ducks which

nest in a wild state on preserves. The hand-rearing or artificial propagation of ducks, which is fully described, has been found to increase the numbers of the mallards far more rapidly than they are increased when the birds nest in a wild state, and there seems to be no good reason why many of the other ducks should not be successfully hand-reared. The game preserver can undertake many interesting experiments, and I have no doubt it will not be long before many species of ducks will be multiplied by hand-rearing, which consists in stealing the eggs from the ducks as they are laid and of hatching them under barnyard hens or in incubators and in feeding the young ducks until they are eight or nine weeks old, when they are turned down on the pond or lake.

All birds are comparatively tame during the nesting season. There is a record of a ptarmigan being taken from its nest on a mountain top in Colorado and handled without causing it to desert the nest. Many birds, however, will cease laying and desert their nests when their eggs are removed, and until the species of ducks which thus far have not been hand-reared can be induced to continue laying when their eggs are stolen, artificial rearing, of course, is impossible, and they can only be bred naturally. As I have suggested, there is an interesting field for experiment with many species which at present are not hand-reared in captivity on preserves.

It is well known that all game thrives best in localities where it breeds (or formerly bred) naturally in a wild state and that birds which are introduced to new regions often do not do well. A knowledge of the breeding range of the wild ducks is important, therefore, and a full account of the range of all of the species which are

worth preserving for food and for sport will be found in the appendix.

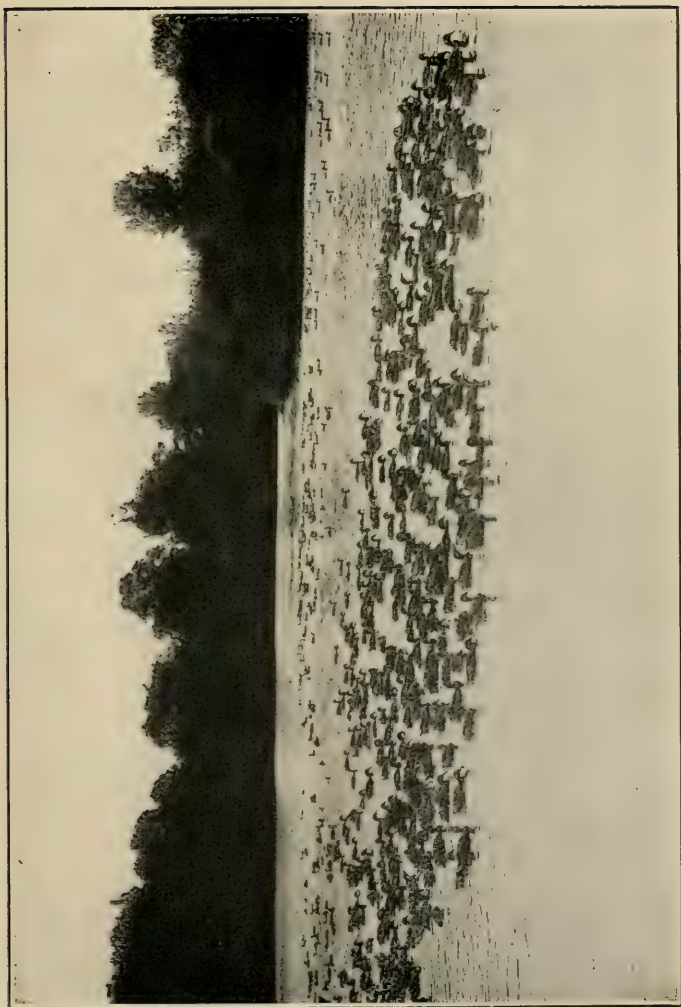
Many species which now breed rarely or not at all in many States once were abundant during the nesting season. The breeding range extended much farther South than it does. Only a few years ago I saw many wild ducks breeding abundantly in the Dakotas, Montana and elsewhere in places where they no longer occur. They have been driven away by incessant persecution and by the draining of the marshes, but easily they can be restored and kept abundant in many places, provided, always, their nesting and feeding grounds be made safe and attractive.

III

WILD DUCKS FOR SPORT AND PROFIT

IT is quite as easy to have wild ducks as it is to have tame ones. The wild birds are far more interesting than domesticated ducks are, and in many places they should be much less expensive to rear since they will procure a good part of their food about the margins of the ponds and in the woods and fields. As ornaments for country places, the alert and handsome wild ducks, which spring into the air from land or water with such great rapidity that the fastest cameras cannot picture them without a blur and which fly about on swift wings, often at great heights, delight the eye and charm the observer, even if he be not interested in the double barrelled gun. The domesticated duck, which cannot use its wings and cannot run or even walk gracefully, in no way can be compared with the trim and alert mallard, teal, widgeon, the beautiful wood-duck, and many other handsome wild fowl which are indigenous to North America.

As objects of sport wild ducks are highly regarded by gunners, and the rearing of these splendid wild food birds can be made profitable under the rational laws permitting such industry which recently have been enacted in some of the States and which soon will be en-



A LAKE FULL OF DUCKS
View on a Preserve in New Jersey

acted everywhere in America. It is less than a score of years since wild ducks first were artificially reared in England, and the older country has, therefore, only a short lead, so far as wild ducks are concerned. American enterprise can be relied upon to overtake her. The ponds and marshes which are suitable for wild fowl are far more numerous and extensive and far less expensive in America than similar places are in England; the properties used for duck rearing in America can be larger than they are abroad, and a greater number of wild ducks can be reared in a wild state by simply protecting the nesting birds from their natural enemies and trespassers and from stray dogs and cats, which are said to do more damage than foxes and hawks.

Much worthless land, partly covered by water, can be made profitable by the restoration of the wild fowl, and the countless lakes and ponds throughout the United States and British Provinces, which are now desolate, can be adorned with this charming form of wild life. Some of the most intelligent State game officers have given this subject their attention, and many individuals and clubs already have begun the good work of restoration and propagation. Many game farmers in England produce thousands of wild ducks and eggs every season, and a number of game farms have been started in America, some of which can fill large orders for both birds and eggs. Some of the duck breeders wrote last season (1909) that they sold all the ducks they produced at satisfactory prices. The mallards and some of the more common species of ducks sold at \$3 and \$4 per pair, and the wood-duck sold for \$15 per pair, and in some places these birds brought even higher prices. The eggs of the

16 WILD DUCKS FOR SPORT AND PROFIT

mallard and black duck brought \$3 per dozen, and the eggs of other species brought \$6 per dozen and possibly more.

The number of sportsmen who are engaged in propagating wild fowl for sport has increased rapidly since the discovery was made that wild ducks can be controlled within reasonable bounds.

My experiments with wild ducks, which will be referred to later, proved that it is a very easy matter to multiply these beautiful and interesting birds and that they will not desert provided they be properly handled.

The rapid decrease in the numbers of our American game birds long has attracted the attention of sportsmen and naturalists. All now realize that we must create before we can safely destroy game, or at least we must control the natural enemies of game and in this way make a safe place for our shooting. Long ago I pointed out the necessity for individual action if we would restore our game and make it again plentiful in our markets. The United States Department of Agriculture in a recent bulletin on "Deer Farming" referred to the necessity for individual action, and the people are learning the reason why the game vanishes and what should be done to make it abundant and cheap.

Herbert K. Job, who has made many remarkable photographs of wild ducks and their nests, writing for *The Amateur Sportsman*, said: "To one who is fond of water fowl it is a real grievance and aggravation to scan with longing eyes the waters of almost any pond or lake in our Eastern districts, however retired the locality, and, ordinarily, see not a solitary duck or web-footed bird floating on the surface. If, indeed, even a solitary duck



BLUEBILLS SUNNING

Photograph by Bonnycastle Dale



HATCHED IN CONNECTICUT

Egg From Saskatchewan—Photograph by H. K. Job

WILD DUCKS FOR SPORT AND PROFIT 17

should be so rash as to exhibit itself in this fashion, the whole neighborhood would rise in arms to kill it or chase it away. What few ducks there are hide in the swamps and venture into the ponds only at dusk and during the night."*

Having described a flock of ducks, containing many of the best species, which he observed near the Harvard bridge, between Boston and Cambridge, and which were perfectly at their ease, because they knew they were in a safe place, Mr. Job says: "There is no earthly reason, especially in regions where wild fowl are somewhat numerous, why this sort of thing might not become a regular and normal condition, to the manifold delight of the land owner and the public at large."

All that is necessary to bring about such desirable conditions is for the people to learn how and where they can have wild ducks in abundance as ornaments or for sport or for profit and that it will pay them in more ways than one to look after the fowl properly.

The Rev. Adrian Woodruffe-Peacock, in a lecture on "Wild Duck Breeding for Sport," published in *The Shooting Times and British Sportsman* (Dec. 8, 1906), says:

"It is not of day dreams in the crowded city or railway carriage that I am now going to speak, but of simple, and at the same time practical, facts, which any land owner or businesslike keeper who has at command a lake, pond or slow flowing stream can turn to profit in increasing the sport which the acres in his possession will supply. Wild duck breeding and training for shooting purposes are quite simple matters—there are no mysteries in the undertaking. It is, indeed, so easy that the wonder is that

**The Amateur Sportsman*, March, 1900.

18 WILD DUCKS FOR SPORT AND PROFIT

it has not extended long ago far and wide over every sporting estate in the kingdom. There are many spots which by nature are only indifferent situations for pheasant and partridge cultivation, that are yet admirably suited for the production of 'high flying wild fowl.'

"As a matter of fact, I have never been resident in a country village where there was a fair supply of water—even when only a small beck, or brook—without finding the wild duck breeding. In my earliest days, too, when from association my attention was especially drawn to them in the Trent Valley, I do not remember a farm yard collection of ducks which was not visited by 'wild flying' drakes from the decoy.* The domestic and wild forms were so frequently crossed in the neighborhood of my home that 'tame fliers'—namely, halfbred wild ducks, which fly away with their cousins—were a frequent source of annoyance and loss at Ashby Decoy. It is with some confidence, then, that I can speak of the wild duck

*A decoy is simply a piece of water of a certain size, from which radiate shallow, curving channels spanned by crescent shaped supports. The supports sustain net, forming a tunnel, known as a pipe. The number of pipes may be from one to a dozen or so, according to the size of the water. The Wrentham decoy, in Norfolk, has ten pipes, a larger number than that possessed by any other active decoy in the Eastern Counties, if not in our islands. Iron supports, their ends firmly embedded in the soil on either side of the channel, are used at the mouth of the pipe and for some distance down, and saplings as the channel narrows. The supports are placed at intervals of about five feet. These arches are usually about twelve feet high and twenty feet wide at the mouth of the pipe. They become smaller and smaller, till at the end of the pipe they are found to be only two feet high; thus when the whole structure is covered with net we have a gradually narrowing and curving pipe, the course of which cannot be seen by the duck till their retreat is cut off. At the end of the pipe is a detachable bag shaped net, known as a tunnel net. The length of a pipe is usually about seventy yards. On the bank of the decoy, and for some way down the convex side of the pipe, are screens, six feet high, and covered with rushes, so arranged in echelon that the decoyman can pursue his tactics without being seen by the birds on the water, and yet can show himself, or

and record a forty years' remembrance of its ways and doings.

"Provided you have water, and trees for shelter, and the fowl are undisturbed by shooting or constant flushing, there is no place so noisy, or so frequented by man, in which the true wild duck will not breed. In the lake of the city park, in the ballast pit by the ever roaring railway junction, close by the reverberating boiler works, where riveting hammers—or Nasmyth's ponderous machinery—are at work, where human scent is wafted to them at every breeze, wild fowl nest and rear their young in peace. It is not the presence of humanity that wild fowl object to—it is to constant, inquisitive interference, or shooting. Any place near water is good enough for them where they are left alone for feeding and breeding. Decoy men are quite right in keeping their waters as secluded and quiet as possible, for the best of reasons. Their native birds gather 'foreigners' into their pond every night, and the slightest unusual sound or human

allow his dog to show itself, at any point. The tall screens are usually connected by low ones, over which the dog, commonly known as a "piper," is able to jump without difficulty. . . . Ducks are enticed into the pipes either by means of decoy birds or by the antics of a dog, carefully trained for the work. . . . At last all the lagging fowl of the gathering have entered the pipe. Then, without a sound, the decoyman darts back to the mouth of the pipe, where, unseen by other bunches of duck on the decoy, he suddenly shows himself to the birds under the net. At the sight of him and his waving handkerchief the trapped birds rise in a cloud and fly up the narrowing pipe. The decoyman, on the bank, follows them at headlong speed. A few moments later he is engaged in extracting his victims, one by one, from the tunnel net and wringing their necks.—"Wild Fowl," L. H. De Visme Shaw, p. 116.

A large number of these decoys are operated in England, Wales and Ireland, and many wild ducks are procured for the market. The first decoy was set up in the reign of James II. "The Land of the Broads," cited by Shaw. Decoying was practiced in Holland prior to the time of Sir William Wodehouse, who constructed the first English decoy. 15,000 fowl have been taken in a decoy in a season.—De Visme Shaw. "Wild Fowl," p. 121.

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aroma sends these strangers to human presence winging their way to discover more secure abodes. Breeding for the gun is altogether another matter; the producer relies on his own stock of birds, and not on the nightly supply of truly wild ones, which are the decoyman's daily profit.

"The ideal spot for wild duck breeding is, no doubt, a hilly country more or less covered with woods, and in them lakes, or lakelets, supplied by perennial burns to keep the water fresh and to bring down a supply of food, such as the Ferintosh part of the Culladen estate, near Dingwall, in Ross-shire. With lakes half a mile apart in a circle amid the hills the finest sport imaginable can be obtained. The fowl can be driven, or trained to fly, from lake to lake, and give the best sporting shots to hidden guns lying in wait. The owner of one lake or large pond need not despair; he can have his shoot, too, in its way as good, and even more certain than that of his luckier neighbor with many waters. When birds are merely driven from lake to lake over guns, the sport is more like flight shooting, as followed by the sea coast, and, in consequence, has also much of its uncertainties. At its very best it can hardly be better when the mere quality of the shooting obtained is considered, without regard to the circumstances of its production, than when the ducks are sent in threes and fours, as they are let out of a cage on a hillside over the guns, to a lake or pond beyond them. Failing a hillside, a line of trees, or nets supported on wires by poles, are nearly as good in giving high flight and speed.

"The mallard* most frequently, in a perfectly wild

*Decoymen make a useful distinction in classing their take of fowl. The male bird, or drake, is "the mallard," the female always "the duck."

state, is a slightly polygamous bird. In pinioned confinement it is absolutely polygamous, and one drake will mate with four ducks, or even five, when in full fertility. Wild fowl live to a great age. In 1876 old Tom Tacey showed me a duck in full male plumage—namely, with green-purple head and curled tail feathers—which he had bred thirty-five seasons before. As he said, she was surrounded by descendants to the twenty-eighth generation, but had given up all interest in breeding matters long before. ‘I only keep her ’cos she’s the best ’coy duck I have, and her young are the best breed I have.’ So much for pedigree.

“Eighteen to twenty years is not an uncommon age for old decoy fowl, but we are not speaking tonight of decoying.

“Breeders for shooting should be careful to use only young and specially fertile stock, selected annually for flying qualities. Additions to the future breeding stock should have been carefully chosen and pinioned before the first battue.

“When undisturbed, the wild duck naturally begins sitting on her eggs about the beginning of April; but nests with eggs, or little ducklings, may be found every month of the year. This, however, is only the case where the birds are robbed again and again of their complement of eggs, just when incubation is on the point of commencing. It is most rare for the wild duck, in a purely natural state, to be truly double brooded, but I have even known cases of this. Food must abound, and the nesting fowl must have perfect security from the disturbance of their own species, as well as from their natural enemies. Almost any situation is good enough for a wild duck’s nest,

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from a hedge bottom, bushy bankside, a bed of nettles in the open fields, to a deserted crow's or rook's nest in the tree tops. Where the birds are much harried by nest seekers, or foxes, they find security on high stacks, pollard willows, or, failing these, in the loftiest nests of tree building birds. The problem is to say where the duck will not nest when it suits her purpose; abroad they sometimes occupy the nesting boxes provided for the golden-eyed duck (*Clangula glaucion*, Linn.) Height is no hindrance to a good mother duck; as soon as her nestlings are fit for locomotion she carries them to a selected spot in her bill. I saw one doing this as late as Aug. 20, 1902. Where foxes and vermin are over abundant the duck is knowing enough to forsake continuous cover or hedges for an isolated bed of thistles or nettles in the open. In bitter weather, hollow trees are not forgotten, if the opening faces south; and, failing all other suitable spots and old nests, a small depression in the open field is taken advantage of."

IV

HOW TO MAKE A WILD DUCK PRESERVE SAFE AND ATTRACTIVE

ALTHOUGH many wild ducks can be reared in a farmyard where there is no pond, lake or stream, provided they have access to a water trough or pan of water at all times, it is evident that they will do better provided they be reared under more natural surroundings near a good sized lake, pond, stream or slough. The place selected for a preserve should, if possible, have several waters at some distance from each other, either a number of ponds or a pond and a small stream or slough, since the shooting will be best where the ducks can fly about from one water to another.

In England there are some small shoots where there is very little water, but the shooting under such conditions is often too artificial to suit our American taste.

There can be no doubt that large numbers of duck can be reared and that they will thrive about very small bodies of water, mere puddles in fact, and on one of the largest preserves in England, where thousands of ducks are shot annually, the little ponds are artificial.

Captain Oates, who owns a small preserve in England, says wild fowl can undoubtedly be reared far from any

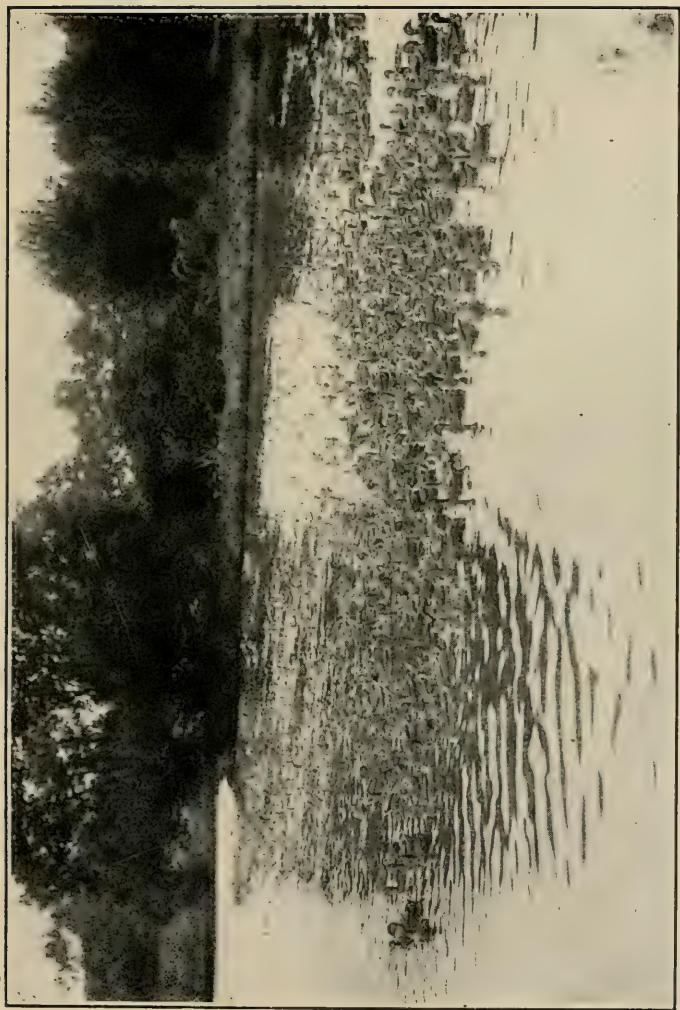
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large piece of water, but I am strongly of the opinion that birds do better on a good sized stretch of water with a stream running into it and out of it. Given these advantages, the running water must be constantly bringing a fresh supply of food, especially after a fall of rain sufficiently heavy to cause a rise of water; further, if the stream which runs out of our lake empties itself into a large river the latter will, when it floods or rises, rapidly cause our stream to back up and bring in a further supply of food from the main river. The supply of fresh food is a gratifying source of economy to the grain bill.

Mr. L. H. De Visme Shaw, in a book on "Wild Fowl," says: "The pieces of water one proposes to convert into duck ponds should be as near the middle of the shoot as possible; the distance separating them from each other should preferably be not less than half a mile. The larger they are the better. Their situation must be so far isolated that there is no risk of the birds being disturbed.

"There may be a stream running through the shoot, or there may be ponds or springs suitably situated. In the former case dams can be built to hold up a body of water sufficient to last through any spell of drought during which the stream may run dry. The possibility of water giving out during a dry season must always be one of the first considerations, this possibility being obviated by efficient puddling."

I have seen several thousand ducks which were successfully reared about some very small artificial ponds on an American preserve, and I have also seen a good lot of ducks which were reared on a quail preserve,



YOUNG MALLARDS ON A NEW JERSEY PRESERVE

where a small pond was made for them by building a very inexpensive dam across a little stream. The big quail preserves in North Carolina easily could produce a large number of fowl about ponds made by damming the small streams.

There are hundreds of thousands of likely ponds, sloughs and marshy streams in America where wild ducks formerly nested, but which have been shot out. The swamps, ponds and sloughs are absolutely worthless for agricultural purposes until they are drained, with the exception of those where cranberries are grown, and there is room enough in America for every gun to have desirable duck shooting during a long open season at a very small expense, provided the ducks be properly looked after and not driven away as they are now whenever they attempt to nest.

Although the ducks can be introduced easily and made abundant in many localities where they never were known to occur, it is evident that the best place to start a duck ranch or preserve is on or in the vicinity of the ground over which the wild fowl travel during their migrations, since many birds will be attracted by those on the ground and will remain to interbreed with them, provided the place be made safe and attractive. The best place of all is, of course, a place where wild fowl are now nesting in good numbers, and there are hundreds of square miles in the region known as the "ducks' paradise," in Canada, where ducks breed every season. One-tenth of this area, if properly preserved, would feed the people of the North American continent with all the ducks they could possibly eat, and, at the same time, the duck shooting throughout the country

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as far South as Florida would be made better than it ever was, and it would remain so for all time to come. As it is, the breeding grounds are being drained rapidly, since it does not pay to keep them for ducks.

Ponds which are shallow and which contain much food in the water and about the shores are more suitable for rearing places for ducks than ponds with rocky or gravelly shores. But even the last named ponds can be made to support a good head of ducks, provided the birds be well fed with grain.

I have had inquiries recently from people in New England who contemplated rearing ducks as to the attitude of the wild ducks towards trout and other desirable game fishes. Since the ponds where it was proposed to introduce the ducks are fully stocked with trout, their owners did not wish to add the ducks if these would put an end to their trout fishing. They were anglers, and the duck shooting was only a secondary pleasure.

My knowledge of the food habits of the more desirable river ducks, which are best suited to the preserve, led me to believe that the ducks would not interfere with or destroy the fishes, especially if the birds could secure the food they liked best, or if they were fed, as they should be, sufficiently to keep them at home. Not having any positive information on the subject, however, I referred this important matter to the United States Commissioner of Fisheries, who wrote as follows in reply to my communication:

"Replying to your letter of April 26, addressed to the Assistant in Charge, Division of Fish Culture, it is not believed that the number of trout and other game fish consumed by

wild ducks amounts to much, but it is not possible to say what damage large flocks of ducks on a preserve, of the kind you advocate, might do if the ponds on the preserve contained an abundance of game fish.

"The ducks valued as game (mallard, redhead, ruddy, scaups or bluebills, canvas back, teal, etc.), feed almost entirely on vegetation, along with occasional snails, worms, etc., and on organisms found in mud, and would not feed on fishes to any extent, even when other feed was scarce, as they are not adapted to that sort of food. The 'sawbills,' or fish ducks, feed on fishes, and so does the hell-diver (grebe or dabchick), which, however, is not a duck at all. The grebes are not numerous enough to do much harm.

"As to fishes eating ducks, the pike would commit considerable devastation where ducklings were available, so would snapping turtles, their worst enemies."*

It is highly important that the place where wild ducks are to be reared, either by hand or in a wild state, preferably in both ways, should be safe and attractive.

A place may be said to be safe when no intruders are permitted to approach it, either men or the natural and domestic enemies of game, which are discussed in another chapter.

It is a well known fact that wild ducks are exceedingly fond of certain kinds of food, especially wild rice, wild celery, wapato, a bulb-like root, fox-tail grass, and various duck weeds and aquatic plants. As stated in the letter of the United States Fish Commissioner, quoted above, the ducks also feed on organisms found in mud, and for this reason muddy ponds are attractive, as all sportsmen know.

It is not so generally known, but nevertheless an important fact, that wild ducks need cover, almost if not quite as much as quail, grouse and other true game birds

*The Amateur Sportsman.

do. Sportsmen who have considered this matter are aware that wild ducks are not so often seen on open ponds and waters, where there are no reeds, rushes or bushes about the banks, as they are about waters where suitable cover, in which they can hide, abounds. It is true that there is more food, including insect food, to be found about ponds and streams fringed with wild rice and other grasses and bushes and trees which furnish acorns and other foods and that food is the most important matter which causes the wild fowl to visit and remain in any given place, but it also is true that the ducks are not well satisfied with a place which has no covers in which they can hide, even if the food be abundant. The wild duck when pursued by a winged enemy will fly into the protecting reeds and rice just as quail seek the briars when they are pursued by their enemies.

Since there is abundant cover and much natural food about hundreds of thousands of ponds and streams in America, where ducks can be restored and made abundant, the matter does not seem to be of great importance. But there are many ponds (in convenient locations where good duck shooting should be had) which have neither cover nor food, and some artificial ponds can be made on the upland preserves in order to have the additional diversion of duck shooting. It is well, therefore, to know how unattractive waters can be made attractive.

Wild rice furnishes both food and cover, and this plant easily can be introduced in many places where it does not now occur. The methods of planting it will be described in the chapter on the natural foods of wild

ducks. Cat-tails and many other reeds and rushes and willows and briars planted about the margins of ponds all make desirable covers, and trees which bear mast furnish both shade and food.

In England, where much of the preserving is highly artificial, the reeds and rushes are not always regarded as desirable.

Mr. De Visme Shaw says: "The great attraction to duck is cover. It gives the birds a sense of security. Mallard—unless kept as tame as farmyard poultry, and not always then—can no more be expected to attach themselves to a bare, open pond than can pheasants be expected to make themselves at home in a locality void of trees and undergrowth. One sees it advised that rushes should be introduced; but, in my own opinion, they are not only unnecessary but undesirable as well; they eventually become a nuisance.

"As temporary cover, let stout brushwood be used, and plenty of it. It should be thrown down roughly—half in, half out of the water. Against the brushwood plant strong young brambles or well rooted runners.

"Islands which have been made in the pond are also to have brushwood and brambles upon them. On the north side of the pond there should be a gently shelving bank, gravelled if possible, but otherwise given a hard surface, whereon the ducks may sun themselves and where they are to be fed."

Briars planted thickly a short distance from a pond form an effective barrier against intruders, including furry vermin and dogs and cats. The reader has observed, no doubt, that ducks often frequent that part of a water which is most difficult to approach. The

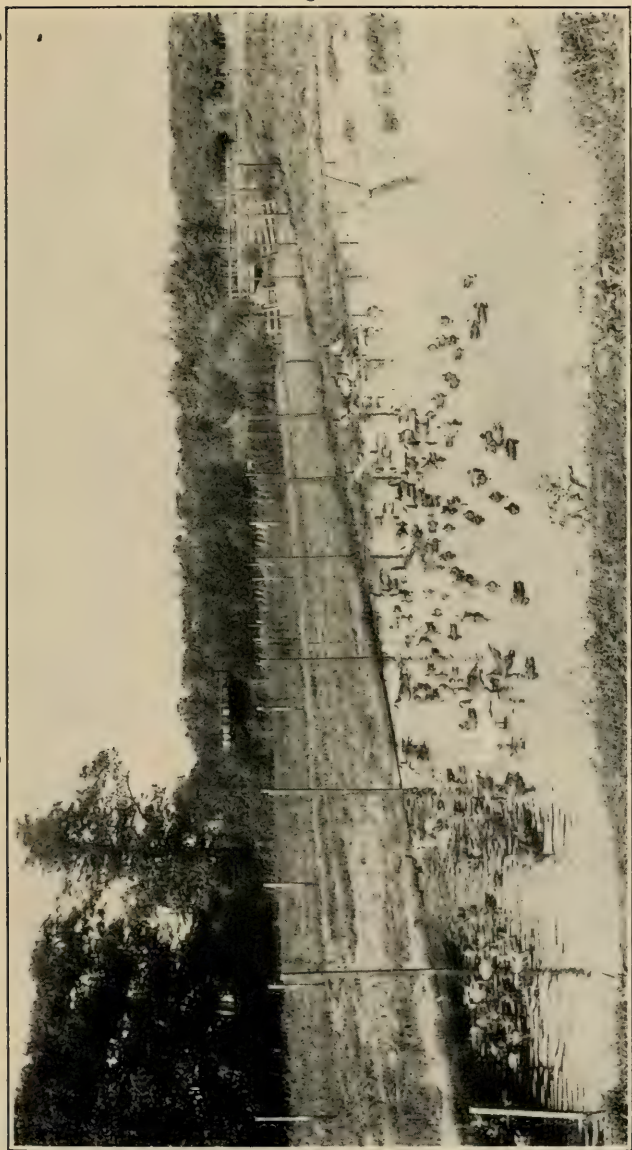
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birds know well where they are safe. The intruder in forcing his way through heavy cover must make enough noise to warn them of his approach.

One or more small islands in a pond are especially attractive. They can be made easily in shallow waters and should be planted with willows or bushes to afford shade and cover. A low wire netting, such as is shown in the illustrations of young mallards on the rearing ponds, is used to turn predaceous animals, and traps can be placed to advantage just outside of it.

The cost of making the ponds safe and attractive is inconsiderable. The ground suitable for ducks can be purchased or rented cheaply, and where clubs, or syndicates, of sportsmen are formed to share the expense of a gamekeeper to properly look after the fowl good shooting can be had at a very low price per gun within the year after the club is formed. Some of the ducks can be trapped and held to insure a breeding stock for the following season or the birds may be shot closely and a new start made the following season with birds or eggs purchased from a game farmer.

If some of the ducks and eggs be sold for propagation or as food they should pay a good part of the cost of production.



WALLACE EVANS' GAME FARM
Oak Park, Illinois

V

WHEN AND WHERE TO PROCURE STOCK BIRDS AND EGGS—ENGLISH AND AMERICAN GAME FARMS

A WILD DUCK farm or preserve can be started by purchasing eggs only and hatching them under barnyard hens or in incubators; but it is more interesting to start with ducks, and when it is proposed to rear large numbers the first season both eggs and ducks should be purchased.

Very quickly after the discovery was made in England that wild ducks could be reared and controlled on preserves a number of game farms were started, which now furnish hundreds of thousands of ducks and eggs to the sportsmen **every year**.

Mr. Bonnett, who at my suggestion wrote a series of articles on "English Game Preserving" for *The Amateur Sportsman*, says: "Wild duck shooting became sufficiently popular in England to encourage the game farmer to give it his attention, and now there is hardly a game farm in the Kingdom that does not pay some attention to the breeding of wild ducks, both for eggs and for young ducks to be supplied for shooting. A hundred, or even fifty years ago, there would probably

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have been little demand in England for wild ducks reared by hand, but the constant reclamation of marsh land and the draining of the fens for agricultural purposes has reduced the breeding grounds of the wild birds very considerably, and good wild fowl shooting of a perfectly natural kind is not easy to obtain at the present time. All the best places are quickly snapped up."

The same condition exists in America. The desirable duck marshes as far West as California are now owned or controlled largely by individuals and by duck clubs, but there are thousands of places where ducks can be introduced and made abundant. Mr. Bonnett mentioned a large number of English game farmers who are engaged in rearing wild ducks and stated the prices of the birds and eggs. The price of wild ducks' eggs from the game farms, he says, is now about £1, 10s. to £2, 10s. per hundred, according to season, or £12 to £20 per thousand. These figures, of course, refer to mallards. The prices for other species are somewhat higher.

Mr. Bonnett in concluding his article said: "There would seem to be a big field open for the game farmer in turning his attention to the rearing of other wild fowl besides the ordinary duck, or mallard. Many other kinds of fowl could doubtless be reared just as easily, and several of them are just as handsome and sporting birds. Among these may be mentioned the beautiful little green runner ducks, the gorgeous shell ducks, the widgeon and the teal as most suitable, but there are several others that might afford sport, notably pintail,* gadwall, shoveller, tufted duck, pochard and scaup.

*Captain Oates writes me that pintail and teal have been tried on preserves and that they do fairly well.

The industry of game farming is new in America, but already we have a number of these interesting places, some of which are as large as the more important game farms in England. These can supply several species of wild ducks and their eggs and the Canada, or common wild goose, in good numbers and at fair prices. The number of game farms is increasing rapidly since the industry is profitable.

One of the largest American game farms in the United States is located at Oak Park, Illinois (near Chicago). Mr. Wallace Evans, the enterprising owner, has given much attention to the rearing of several kinds of wild fowl and can supply thousands of ducks and eggs.

In the story of his game farm* Mr. Evans said: "In the race for 'more game' America has already distanced England, the land of game farms and preserves. This seems the more remarkable since in England there is far more freedom in the matter of rearing and selling game, as The Amateur Sportsman often has said, than there is in the land of the free."

Mr. Evans said that he would rear during the year 1909 8,000 pheasants, besides wood-duck, mallards and wild geese, mandarins and other water fowl.

Wenz & Mackensen have a prosperous game farm at Yardley, Pennsylvania, and this firm also can supply thousands of ducks and eggs. Mr. W. A. Lucas represents the Clifton Game and Forest Society, which has a game farm on Long Island where mallard and black ducks are reared and sold alive for propagation.

The Whealton Wild Water Fowl Farms at Chincoteague, Virginia, rear thousands of ducks, geese and

*The Amateur Sportsman, September, 1909, p. 12,

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swans. More dusky, or black, ducks are reared on this farm than anywhere in the country. Other game farms are located in Kansas, Missouri and Colorado. The Fair-View Farm on Hudson, Highland, N. Y., also advertise wild ducks. In some States some of the ducks can be sold in the market as food.

Besides the game farmers there are now a number of large game preserves in America, some of which can, at times, supply ducks and eggs.

The number of game farms and preserves is increasing rapidly, notwithstanding the inimical laws which prohibit the sale of game or only permit it during a short open season. The sentiment of the people now is opposed to the arrest of those who are engaged in such industry and in favor of the proposed breeders' law providing that those who properly look after game and increase it shall have the right to sell it alive for propagation or as food in the markets. There can be no doubt that as soon as this law is enacted in all of the States (it has been in some) America, as I have said, will become the biggest game producing country in the world. The game farms rapidly will increase in number.

The rearing methods employed by the game farmers are similar to those described in the chapters on the rearing and handling of wild ducks.

Wild fowl have never been regarded as true game within the meaning of the game act in England, and the wild fowlers, or market gunners, always have been permitted to shoot wild ducks for the market on all public waters, saltings, and on many lands about the coasts owned by the Crown. Wild ducks often are

cheaper in the English markets during a long open season than beef or poultry are. One of the chief merits of field sports and of game preserving is that they tend to keep many people in the country and furnish a desirable employment for many gamekeepers. There can be no doubt also that when game preserving is more generally undertaken in America the market gunners can be permitted safely to shoot on our public waters, and there would seem to be a better excuse for this shooting (if any apology for the killing is needed) than there is for the shooting of those who shoot only for sport.

Wild ducks' eggs should be purchased very early in the Spring, when the ducks begin to lay. The orders should be placed in the Autumn or Winter in order to be sure of procuring the desired number. Mallard eggs in America are now sold for about \$3 per dozen, or from \$20 to \$25 per hundred. Although this is about twice as much as the eggs cost in England, I am satisfied that there is no economy in purchasing eggs abroad. Not long ago I purchased a lot of eggs from an English dealer, and, although they were securely packed and none was broken in transit, the percentage which hatched made the young ducks cost more than they would have cost if they had been hatched from American eggs. It is fair to say, however, that the eggs were hatched in an incubator, and they may not have been handled just right.

The hens should be purchased or rented before the eggs arrive. On some preserves the hens are rented from the farms in the vicinity of the preserve; the rent paid on a Long Island pheasant preserve is 25 cents.

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per hen. I believe it is more economical to purchase the hens.

Wild ducks for propagation should be purchased in the Autumn or Winter in order that they may become accustomed to their new surroundings; otherwise they may not breed the first year. Birds which have been reared in captivity are more likely to breed than freshly caught wild birds are.

I believe it is advisable to purchase the stock ducks from several widely separated dealers, since in this way an admixture of blood from two or more different flocks is secured, and this is known to be desirable in breeding all animals.

Mallards and black ducks were sold last season (1909) at from \$3 to \$3.50 per pair. Sprig-tailed ducks and teal sold for a little more. Wood-duck brought several times as much, but the prices undoubtedly will be lowered as the birds become plentiful in the markets. It seems likely that American game farmers will not be able to supply all the sprig-tails, widgeon, teal, and other fowl needed on the preserves next season, and it might be well for the preserve owners to purchase some English teal and sprig-tailed ducks. These can be procured through the dealers I have mentioned, and they should breed the first season provided they be purchased in the Winter. I expect to make an experiment with these ducks next Spring, and I would strongly advise others to do so, since a mixed bag is desirable.

The gamekeepers say it is well to purchase ducks not over two years old, and reliable dealers may be relied on to send the birds ordered.

I plucked some of the feathers from one wing of the

ducks with which I made some experiments, and I prefer this method of confining them to pinioning, since the birds can fly later when the wing feathers grow in again. I was surprised to see how rapidly the feathers were replaced, and I plucked my ducks several times before permitting them to fly about. On game farms many of the stock birds are pinioned, of course. After the birds have mated and the ducks begin to lay there is little danger of their deserting, provided they are well looked after and fed regularly.

In a wild state the ducks are monogamous, or nearly so, but on the preserve one drake seems sufficient to serve two or three ducks when they are yarded. When the ducks are kept in flocks and have access to a large water, Captain Oates says, there should be plenty of drakes, say fifteen drakes to twenty ducks.

When the preserve is well situated on or near other waters which are preserved or which are much frequented by migratory birds many visitors may be expected, and often a wild bird will remain to mate with one of the ducks on the preserve. It is desirable to prevent elopements, and many gamekeepers trap the visitors and pinion them.

It is an easy matter to trap some of the visiting ducks in a wire enclosure (built partly on the land and partly in the water), open on the water side, where there is a sliding door which can be dropped after the wild ducks enter the trap, or a swinging door which will close quickly when a catch is released. The tame ducks can be fed daily in this enclosure, and the wilder birds will follow into the trap, when the trapper, who controls the door by means of a string, is well concealed.

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The wild birds can be held by clipping their wings or pinioning them, and soon they will become quite as tame as those on the ground. I enjoy much seeing the ducks up in the air, and I do not like those which cannot fly well. It is a beautiful sight to see the flock circling about overhead or making long flights over the surrounding country when you feel sure they will return, but there is always a danger that strangers may lure your birds to make a longer journey than is desirable, and for this reason it is well to control the breeding ducks during the Spring migration and to trap enough breeders in the Fall before the shooting begins to restock the place another year. Where many birds are induced to nest on the preserve they will more than offset any losses that may occur, and, in fact, a few score of breeders will supply a good lot of shooting and also serve as decoys. Some English writers think it is a mistake to allow any birds to breed wild, but this, of course, means shooting of a more or less artificial character, although the hand-reared birds may often fly as high and as fast as the wilder birds do. I prefer both wild and hand-reared birds, but on a small shoot and as ornaments for a country place or city park the last named are the more suitable, since they are easily managed and can be kept at home as easily as tame pigeons can be on comparatively small areas.

There is one good thing about hand-rearing: The birds can be multiplied rapidly, and good shooting can be had within eight months after the start is made. Pheasants and other upland game can be reared in the vicinity of the duck ponds, and I have seen the pheasants very abundant, breeding wild, in the marshes

owned by a duck club. They were benefitted, of course, by the protection given to the ducks.

A syndicate of sportsmen recently has been formed in New York to propagate wild ducks on a large scale. Skilled gamekeepers will be employed, and the upland game will be made abundant, undoubtedly, in the vicinity of the duck ponds. An estimate of the cost of the undertaking will be found in the chapter on How to Form a Duck Club.

VI

NATURAL FOODS OF WILD DUCKS

IT is an easy matter to attract wild ducks to places where their natural foods are abundant and to hold them, provided the grounds be made safe and the shooting be done in a manner which will not drive them away. On the English preserves the ducks are fed largely with grain, but there are many places in America where their natural foods are abundant. On many desirable places, however, the ducks are seldom, if ever, seen on account of the persecution they are sure to encounter.

A gamekeeper is required, of course, and since the ducks can be multiplied far more rapidly by hand-rearing than they are when breeding wild, he should produce many ducks by this means in addition to the ducks which breed in a wild state. Many plants which furnish food for wild ducks can be introduced and grown in places where they do not now occur, and a number of dealers can supply wild rice and wild celery, two of the most important foods. The principal dealers are Northrup, King & Co., seedsmen, Minneapolis, Minnesota; Clyde B. Terrell (R. F. D. No. 5, Box 40), Oskosh, Wisconsin, and R. B. White, Waterlily, North Carolina.

Northrup, King & Co. can supply both wild rice and wild celery and possibly other natural foods for ducks, and they have issued two booklets about the wild rice and celery and how to plant them, which will be sent free upon request. Mr. Clyde B. Terrell deals in wild celery and issues a circular telling how to plant it, which he will mail to anyone applying for it. R. B. White can supply wild celery, both the seeds and the roots, and also fox-tail grass and other foods.

The wild rice furnishes both food and cover and is a valuable plant wherever it can be successfully grown. Formerly there were many complaints that the wild rice seed failed to grow when planted, but the cause for many failures has been discovered and recently it has been successfully introduced in many places.

Although the wild rice is regarded by many gunners as the most important natural food for ducks, other natural foods seem to be quite as valuable, and some of them may be grown in places where the wild rice does not thrive. In *The Amateur Sportsman* for October, 1910, I printed an interesting and instructive letter from Dr. R. V. Pierce, who has been very successful in introducing the fox-tail grass and several other duck foods, but he said he had no success in raising wild rice.

The sportsmen who own shares in the duck clubs throughout the country where no practical preserving or hand-rearing of wild fowl is attempted long have been interested in wild rice, wild celery, wapato and other natural duck foods as a means of attracting the birds to their shooting grounds, but with the growth of practical preserves, where ducks are encouraged to remain and nest in a wild state and where also they are

hand-reared in large numbers, the importance of the natural foods has grown rapidly.

In a bulletin on "Wild Rice, Its Uses and Propagation," issued by the Bureau of Plant Industry, United States Department of Agriculture, we are told that by far the largest demand for information regarding this plant has come from men or organizations wishing to secure viable seed for planting near shooting grounds to attract wild fowl. In the future this information will be sought by those who are breeding wild ducks for sport and profit.

The bulletin referred to and a second bulletin on "The Salt Water Limits of Wild Rice," issued by the same department, will be of more economic importance and value now that the States and Provinces have begun amending their game laws so as to permit the profitable industry of game breeding. It seemed hardly worth while for one department of the Government to issue expensive bulletins telling the people how to produce foods for breeders when another department was actively interested in game laws prohibiting such industry. The two bulletins above referred to contain much information about wild rice and the best methods for its introduction. The earlier experiments with this plant failed, undoubtedly, because the seed was dried before shipping and planting. It is now packed in moss and shipped wet.

Wild ducks also are fond of mast and eagerly devour acorns, beech nuts and other small nuts, and all of these foods impart a fine flavor to the flesh. On preserves where these natural foods abound, or when they are introduced and made abundant, they will be found not

only to attract migratory fowl, but also they will reduce the grain bill.

I recently saw hundreds of mallards on a New Jersey preserve feeding on acorns which had fallen in a road and on the lawn which bordered an artificial pond, and I have often shot mallards, wood-ducks and other river ducks, or dabblers, in the Central and Western States when they were feeding on acorns and other mast.

On the Pacific coast the wapato is a favorite food for wild ducks, and it has been successfully introduced in ponds and lakes where wild ducks are properly looked after. I am not aware of any dealer who handles this plant or if it has been used anywhere in the Eastern States. Mr. W. A. Howe, of Carleton, Oregon, who owns a small farm, which has a small lake thirty acres in extent, formerly fed the wild ducks with wheat and in this way secured some very good shooting. In writing to *The Amateur Sportsman* he said: "We have given up using wheat, as a few years ago I planted the lake with wapato, a native bulb which thrives in all lakes in this vicinity and of which the ducks are very fond. In this way we have plenty of ducks for all reasonable shooting and, of course, at a much less expense. I do not know how the wapato would stand transportation. The bulb resembles a small onion and grows freely in this country in muddy ponds and swales where there is a foot or so of water."

Mr. Howe informs me also that the carp, which were introduced by the United States Fish Commissioners, have entirely destroyed the wapato in many waters. This undesirable fish also has destroyed the wild rice in the Sandusky marshes, Ohio, and in many other

places, and duck breeders should see that the carp are not introduced in their waters or should destroy them, if possible, in waters where the natural foods for ducks are planted. Mr. Howe says he has no carp in his lake.

In the letter above referred to Dr. Pierce says:

"I have planted a good deal of wild celery seed, *Valisneria spiralis*, which I have obtained from Mr. Jasper B. White and from other individuals in different parts of the country, with very good success. I succeeded much better by planting the seed of the wild celery than by planting the roots of the same, and it is much cheaper to obtain the pods of the wild celery and plant them than to undertake to transplant the plants. My lakes and ponds are now quite well seeded with this plant. I have also planted a good deal of the *Potamogeton pectinatus*, or 'fox-tail grass,' and with good success. I regard the fox-tail grass as one of the most valuable duck foods because it seeds prolifically and, also, produces bulbs which are much sought after by many species of ducks; in fact, by all the species; also by wild geese. 'Fox-tail grass' spreads very rapidly. When once produced in a duck preserve, one need have no fear of its ever running out or failing to grow abundantly.

"I have several other species of *Potamogeton* which are indigenous to my lakes and ponds, one of which is well worthy of mention, as it is prolific in the abundance of seeds which it produces and spreads rapidly. I refer to the *Potamogeton lucens*. *Potamogeton persillus* also grows to a considerable extent in my lakes and ponds and produces considerable seed. This year a most bountiful crop of water chinquapins, or *Nelumbo lutea*, have made their appearance in my lakes and ponds, covering

many acres. It is a very interesting plant, has a beautiful bloom of great fragrance and produces small nuts about the size of a rather undersized acorn, of which all classes of ducks are exceedingly fond. I have not planted much of any variety of *Polygonum*, or smartweed, but have several species growing in my duck ponds, which the ducks seem to feed upon very much. The two species most successful in this line are the *Polygonum punctatum* and the *Polygonum lapathifolium*. The latter is a very large species and grows a good deal of seed, and I consider it quite valuable as a duck food. A small sedge grass grows quite freely in some of my lakes and ponds, and is known by botanists as *Cladium effusum*. It is generally distributed through the South, I believe, and is frequently found in the gullets of ducks when examined. I have not had any success in raising wild rice, *Zizania aquatica*. I have sowed large quantities of wild rice obtained from Canada and from Minnesota, and, while it would grow to some extent, it would not mature seed. Probably the jump in latitude was too great for it. I am now endeavoring to obtain some wild rice grown in the Carolinas, and hope that it may do better. *Thalia divaricata* is a plant which grows on my preserve quite extensively and is much sought after by ducks, especially mallards, who feed upon the seeds growing upon it very freely. The plants grow from five to ten feet high and hang full of seed of large size, and I have been planting considerable of it as I regard it as a very valuable duck food. 'Widgeon grass,' or *Rupia maritima*, grows freely in many of the lakes and ponds of St. Vincent's Island, and its seed is almost universally found in the gullets and gizzards of ducks shot on the preserve.

"The foregoing are some of the most important duck foods on my preserve and most of which can be readily introduced with a little pains and persistency by anyone who takes the pains and trouble necessary and has the proper sort of environment for these plants to flourish in."

Mr. Whealton says: "My young and old shovellers will eat all the tadpoles and frogs they can catch, and their greatest activity is shown in the pursuit of such prey.

"In regard to the food of wild ducks not in captivity, I will state that our bay, Chincoteague Bay, about six miles wide and extending northward over forty miles, has its shallow bottoms covered with various aquatic plants, mostly 'ell grass,' as our people call it, and this is the chief food of our wild geese, brant and ducks. The red-heads and scaups feed after the geese to get the grass which the former pull up from the bottom. The black, mallard, sprig-tail and teal eat, in addition to the salt water plants and grasses, or rather, the grasses of the brackish or partly fresh water of the upper bay, the special duck grass that grows in the fresh and partly fresh water ponds of our marshes and on our islands, etc."*

An English writer recently said that on a large number of estates both in England and in Wales there is swampy land that is useless to the farmer and under its present condition is worse than useless for shooting. This land can be made most valuable to the sporting

*Letter to the author. Dr. Pierce and Mr. Whealton have had excellent opportunities to study the food habits of wild ducks, and I am much indebted to them for assistance in the preparation of this chapter.

tenant with a small cost. First, he says, it should be fenced with large mesh netting to keep out hunting dogs. Second, open some pools in the most convenient and quietest parts. In these place some boxes containing soil and plant watercress in the boxes. Nail some netting over the tops. This will prevent the cress from washing out. Place the boxes in the pools; there the cress will grow and seed and soon establish good beds of cress. Third (and most important), get some willows in variety, and plant these at a distance of three or four feet apart. Insert pieces about three and a half feet long in the ground; these in a few years will treble the cost of planting and the wild fowl will have places in which to feed and to breed. The shooting will be greatly improved, for if a few duck were pinioned on these places the wild birds will breed and rear their broods in safety. The willows can be cut every year or two. Firms who make baskets will buy them.

Wild ducks require very little water, and they will frequent and breed beside very small ponds, provided they find an abundance of food and safe quarters. If the ducks are abundant they should, of course, be fed at least one meal of grain daily, and the best time to feed this is late in the day, since feeding at this time tends to prevent their straying. Some interesting experiments with wild ducks can be made, inexpensively, on thousands of farms in America which now contain worthless swamps and boggy places.

In addition to the plant foods, the ducks devour many insects during the Summer, and they procure about the ponds and streams much animal food, such as snails, worms, and small organisms found in mud. Many of

the ducks, undoubtedly, may take small fish when they cannot obtain other food, but, as I observed in a former chapter, they prefer a vegetable diet, and their flesh is much better for the table when they are feeding on grain, mast and the plants named above

VII

ARTIFICIAL REARING OF WILD DUCKS

WHERE ducks are artificially reared they should be induced to nest in safe enclosures, wired against vermin. The nesting ground should be a grassy field, shaded on one or more sides by trees, which also give shelter from cold winds. The nesting places usually are made of brush arranged to form little shelters over the nests. On some preserves the nests and sheltering covers are very elaborately made, but on the preserves where I have seen thousands of ducks the nests were simply protected by small brush stood up in a conical form with an entrance at one side for the duck.

Captain Oates says: "Ducks love to nest in stacks, and I have known a pinioned bird to work her way up the side of a stack and make her nest fifteen feet from the ground. In stacks birds can burrow so deep that no weather, however inclement, can damage the eggs. Outhouses, too, are very favorite places for ducks to lay in; also old stick heaps and the bottom of thick hedges."

On a Long Island preserve I saw ducks nesting beside an overturned stump among the roots and on a

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preserve in North Carolina many ducks nested on the bank of a small stream, often under the projecting roots of trees or beside a log.

It is an easy matter, and an important one, to induce the ducks to lay their eggs within a field which is wired against ground vermin. The fence is made of chicken wire and is run into the ground, and the wire is turned outward underground so that any rat, or other vermin, will not be able to enter the field. Traps are placed outside the fence and always beside any holes where vermin has been digging.

No one had any success in rearing the young ducks in England until the proper food for them was discovered. This was invented and made by a well known dealer in foods for pheasants and poultry, and duck rearing at once became common on the preserves and on many game farms.

A number of excellent wild duck meals are now manufactured in England and in America, and the best of these may be obtained from the Spratt's Patent (Am.) Limited, Newark, New Jersey, or from at least one game farmer, Mr. Wallace Evans, of Oak Park, Illinois.

Since young ducks live largely on insects, it was necessary to provide some animal matter in the food. The gamekeepers, however, quickly transfer the young ducks to a grass field after they are hatched, where they can secure some insects, the more the better, no doubt, and the coops in which the hens are confined are moved from day to day in order to give the young birds fresh ground and a better chance to secure insect food. Mr. Whealton writes:

"I feed all my young wild geese, ducks and swan, from



MALLARDS FLUSHED ON REARING GROUND

the first day they are hatched until ready for adult fare, on coarse yellow cornmeal alone, and the food I use most exclusively for all adult wild fowl is corn—corn in the whole grain, rarely the cracked form—and this fare I have adopted after many years of experiment with various mixtures of grain, wild duck feed, *et hoc genus omne*.

"I should add that I do not confine any of the young wild fowl, but let them go with the parent birds to forage for themselves, and no doubt they greatly supplement the ration I give them with the many kinds of insect life and the seeds, leaves and roots of the various forms of land and aquatic grasses and plants that abound in my enclosures. The Canada goslings begin nibbling grass certainly by the second day of their existence and do not seem inclined to take to the water as early as the young ducks and cygnets, which almost roll out of the egg shell into the water and begin swimming on their natal day.

"The cygnets of the Black Australian swan as well as the adults themselves are foragers par excellence in all seasons, as the young of these erratic but wonderfully prolific breeders are hatched out as often in midwinter as in midsummer. The young black ducks seem to derive a great amount of satisfaction as well as nutriment from the ooze and mud of the banks and shallow bottoms, which they industriously sift through their bills, while the adults are almost omnivorous, eating all kinds of roots, grasses, seeds, flies, insects, minnows, crustacea, etc. (I have opened the craws of those killed on our marshes and found them full of periwinkles swallowed whole.) Gourmands, these fellows, with wonderful powers of digestion."

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The reader should remember Mr. Whealton's statement that his young birds are not confined and supplement the cornmeal ration, which he feeds, with many kinds of insect life and the seeds, leaves and roots of various land and aquatic grasses and plants, "which abound in his enclosures." The English writers and gamekeepers regard the duck meal as essential where the ducks do not secure the supplemental foods mentioned. I have records of many thousands of ducks which were reared, almost without any loss, on the prepared duck meal.

Ducks are now reared even more easily than pheasants are, and the young birds seem less subject to diseases.

At one time the small bantams were regarded as the best foster-mothers for pheasants and ducks, but the common barnyard fowls of all breeds are now regarded as good as any; the most docile hens and those which are the more easily handled at the feeding time are better than hens which are wild and unruly, since the last named break the eggs. Duck eggs are more fragile than the eggs of poultry.

At a duck preserve in New Jersey, where I spent some time studying the gamekeeper's art, the sitting hens are placed in boxes which are built inside of a hatching house (see illustration) extending from the floor nearly to the low ceiling. The hens are tested on eggs until it is ascertained that they will sit steadily, when some of the duck eggs, which have been gathered in large numbers, are placed under them.

The eggs when they are gathered are placed on end in a tray containing bran, sawdust, hay or other suit-



INTERIOR OF HATCHING HOUSE
Gamekeeper Taking Hens Out to Feed Them



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able material. They are turned daily and will remain fertile for several weeks, during which time they are placed under the hens or in incubators.

From ten to fifteen eggs can be hatched under a common hen, but it is well not to have too many, since the hen may not cover them all. Mr. De Visme Shaw says let the clutch number no more than seven if the hen is set in cold weather, and in no case more than ten. I am inclined to believe that most hens can handle a dozen eggs, in proper nests, nicely, but the breeder can learn by experimenting just what his hens can do. When the eggs are abundant and the hens scarce it is well to put them to their full capacity. Captain Oates advises making the clutch twelve eggs for hens and thirteen for ducks, and, he says, five of his ducks hatched no fewer than sixty-five ducklings. He advises leaving two or three eggs in each nest when the eggs are gathered.

The first few eggs laid often are infertile, and these may be marked and left in the nest to encourage the duck to continue laying. Wild ducks will lay many more eggs than they can hatch. When the eggs are removed, after enough eggs for one or two clutches have been gathered, the duck should be permitted to sit and hatch a brood.

In an article written for *The Amateur Sportsman*, Captain Oates says one should get from twenty to thirty-three eggs per duck each season. He has even done much better than this at times. "Some years ago," he says, "I tried an experiment and turned into a small enclosure two pure bred wild ducks which I had reared from wild eggs, and also a wild drake which I had cap-

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tured. I fed these birds myself and also collected the eggs daily. No one else was permitted to enter the pen. The result was surprising. I obtained 119 eggs between February 21 and June 1. I was most particular in giving the birds a flower pot full of worms each day. On two different occasions three eggs were laid in one day. An account of this extraordinary occurrence was sent to the Field (London), and it was pointed out by me that it was impossible for other birds to enter and lay in the pen and that the eggs were collected on the days before and after the occurrence. Further, the eggs were those of the two birds mentioned, their shape and color exactly coinciding with those previously laid. However, I do not advise confining the birds in any way; give them plenty of liberty and the eggs will be fertile and the hatching percentage a high one."

Elliot says the mallard breeding wild usually lays only six eggs, and the reader will observe how much more rapidly the wild ducks are increased in numbers on the preserve than they are when breeding wild. One or two hundred ducks should easily produce from two to four thousand young birds, and even more if the average of thirty-three, named by Captain Oates, should be attained.

The nests in the hatching boxes shown in the illustration are made of a heavy sod from which the earth has been partly removed in the middle so that it will become concave when it is placed in the box.

Oates says to use any square box of sufficient depth and, having cut some pieces of sod, build up the corners of the box with them; then cut a square sod to fit

ARTIFICIAL REARING OF WILD DUCKS 55

the size of the box and, having removed some of the earth underneath the center of the sod, place it, grass upwards, in the box. Line the nest with dry moss.

Mr. De Visme Shaw favors placing the nests on the ground. The sitting hens and ducks should be fed on corn or other grain, and the hen should be taken off and fed and watered daily.

When the duck starts to sit, if she has not enough eggs the nest can be filled up from the eggs which have been previously gathered. It has been recorded in the *Shooting Times* and *British Sportsman* that a duck will dispose of an egg or two if she thinks she has too many, and Captain Oates says upon one occasion when one of his ducks was sitting on fifteen eggs a friend on whose veracity he could rely, saw the duck fly from her nest, close to where he was standing, with an egg in her bill. She flew to the water about 150 yards away, apparently without breaking the egg; but, unfortunately, his friend could not get up in time to see what she did with it. She hatched out the rest of her eggs satisfactorily.*

Since the wild duck returns to her nest with her feathers wet after being on the water, the wild duck eggs should be sprinkled occasionally with tepid water when they are hatched under hens. This should be done effectively as the time for hatching approaches.

Mr. De Visme Shaw advises that on the twenty-fifth day the eggs and nest be removed and that a quart or more of water be poured into the nesting box, allowing

*Captain W. Coape Oates' "Wild Ducks." For breeding periods of the different species breeding wild, see Audubon *Am. Ornith.*; Wilson *Ornith.*; Baird, Brewer & Ridgway, *N. A. M. Birds*; Appendix.

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the liquid to be thoroughly absorbed by the earth before putting back the nest and eggs. This might do when nests are made on the ground, as Mr. Shaw advises, but less water should be used when the nest is made on a sod in a box. A thorough sprinkling of the eggs and a little water on the sod is all that is required.

The earlier experiments in hatching wild duck eggs in incubators were failures, since the fact that the duck eggs need moisture was overlooked. More recent experiments have been more successful when the eggs have been sprinkled with tepid water. I succeeded in hatching some eggs (which I imported from England) in an electric incubator. These eggs were thoroughly sprinkled as the hatching time approached.

Ducks' eggs take from twenty-four to twenty-nine days to hatch, as a rule, though occasionally a lot of eggs that have been put down soon after being laid will hatch in twenty-three days, if placed under a good hen. Twenty-six days may be said to be the usual period of incubation.

Wild ducks should not be permitted to interbreed with tame ducks.

The Shooting Times and British Sportsman says:

"Any reader who possesses a stock of real wild duck has a valuable thing, which he may turn to good account. Those stocks which have been hand-reared for the last ten years have become so impregnated with domestic blood as to be practically useless for first-rate sport, because they neither can nor will fly high. A real wild duck rarely associates with the domestic varieties, and, as far as we have been able to ascertain, never interbreeds



YOUNG DUCKS INCUBATED BY ELECTRICITY IN NEW YORK

The eggs were imported from England by the Author. The darker birds are Mallards; the others are Tame Ducks.

with them,* but his partially tame brother has no such reluctance, and if the two kinds are near each other it is difficult to keep them apart. Game farmers are also guilty of infusing domestic blood, for they have found that a stock of duck having such an infusion were easier to pen and manage, and the larger size of the birds they thought would appeal to their patrons. However, what is the use of a bigger duck if it refuses to fly, for the primary motive with which they are reared is to provide sport, and size and quality is quite a secondary consideration. The true wild duck is a delicious bird on the table, and the slightest introduction of domestic blood appears to destroy its peculiar piquant flavor.

“At the present time there is a great desire in shooting circles, where the hand-reared duck as a sporting bird is appreciated, to revert to the true stock, and thoroughly stamp out the halfbreeds. This is why we declare that he who has a true stock holds a valuable possession, for the eggs are likely in the near future to command a big price. There is no mistaking the egg of the real wild duck, its shape being perfect and its delicate coloring of pale sea green unapproachable. The slightest infusion of domestic blood appears to rob it of these characteristics, and the egg laid by a bird possessing such blood in ever so small a degree becomes larger in size, and the green gives place to a dirty white. The first, and even second, nest of eggs laid by a wild duck may be picked up for sale, and she will lay again, possibly only half a dozen on the third occasion, but they will be as fertile as those produced earlier, and the ducklings will be hatched at a

*This statement seems to be erroneous. In America the wild mallard often interbreeds with tame ducks.

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season when they are easily reared. There will thus be about two dozen eggs available for sale."

On Long Island, N. Y., and elsewhere about the Atlantic coast there are many half-bred ducks which can fly fairly well, but the reader should insist that the ducks purchased for a preserve have no infusion of domestic blood. It is most desirable to have birds which will fly high and fast.

VIII

YOUNG DUCKS ON REARING FIELD

WHEN the young ducks are hatched they should be removed, with their foster-mother, to a grassy field, wired against vermin, the hen being confined in a coop such as is used when young chickens are reared. The young ducks are allowed to run about by day, and the coop is closed, by a sliding door made of wire, at night. The coop should be placed facing the sun, and it is wise to have a windbreak behind it to keep cold winds from the little ducks early in the season. The birds should not be moved to the field until they are quite dry and lively—when they are about one day old.

The ducklings require hardly anything to eat or drink during the first twenty-four hours after they are hatched. They, no doubt, will spend their time under the hen. They should be fed at first on a little duck meal scalded and placed on a plate or pan outside the coop. A little of the food can be scattered in the grass and within the coop to attract their attention, but it is not wise to continue feeding them anything inside the coop for sanitary reasons. The hen, of course, should be fed and watered at least twice daily.

The young ducks should be fed very early in the

morning, and often during the day for the first two weeks. Only a little food should be given at a time, and not more than they will eat, since it is not desirable to have stale food about.

Mr. De Visme Shaw says young wild ducks will do well if fed as their domesticated relatives are usually fed; but they do better, and this with less trouble to their attendant, if raised from the shell on food specially adapted to them—such as Gilbertson & Page's largely used wild duck meal—the special food containing a correct proportion of animal matter.

Mr. Edgar, one of the most successful gamekeepers in America, whose ducks are pictured in several of my illustrations, uses exclusively the duck food sold by the Spratt's Patent, Limited, of Newark, New Jersey, and he has had remarkable success in rearing his young ducks.

Until the ducks are about fourteen days old they should be fed at intervals of from two to three hours, daily, the first feed being given as soon after daybreak as possible. From this age until they are about a month old the intervals between feeding times should be about four hours. A fortnight later three meals a day are sufficient.

I fed a lot of young dusky ducks (black ducks) with scraps from the table. They usually had some oatmeal, force or other cereal in the morning, and they ate bread and vegetables. Often when one had a meat bone the others would chase him about the yard just as chickens often chase the one which has secured a bit of food of any kind. Early one Sunday morning they devoured all the rolls left by the baker.

It was not long before my ducks discovered the kitchen garden, which was some distance from the house and from the yard where they were fed. They daily made excursions to the garden, usually on foot, sometimes on the wing, and in order to learn what they liked I permitted them to do considerable damage. They were fond of lettuce. This was the first plant they encountered as they entered the garden, and I do not recall anything which they did not sample liberally. They were very fond of cucumbers, and in one afternoon they devoured several hundred young cucumbers, which were to have been made into pickles the following day. They destroyed watermelons, which were nearly ripe, cutting them in two with their bills and greedily devouring the fruit, eating very close to the rind. Several ducks' heads were crowded into the big half melons at one time, and there was soon nothing left save a thin green shell.

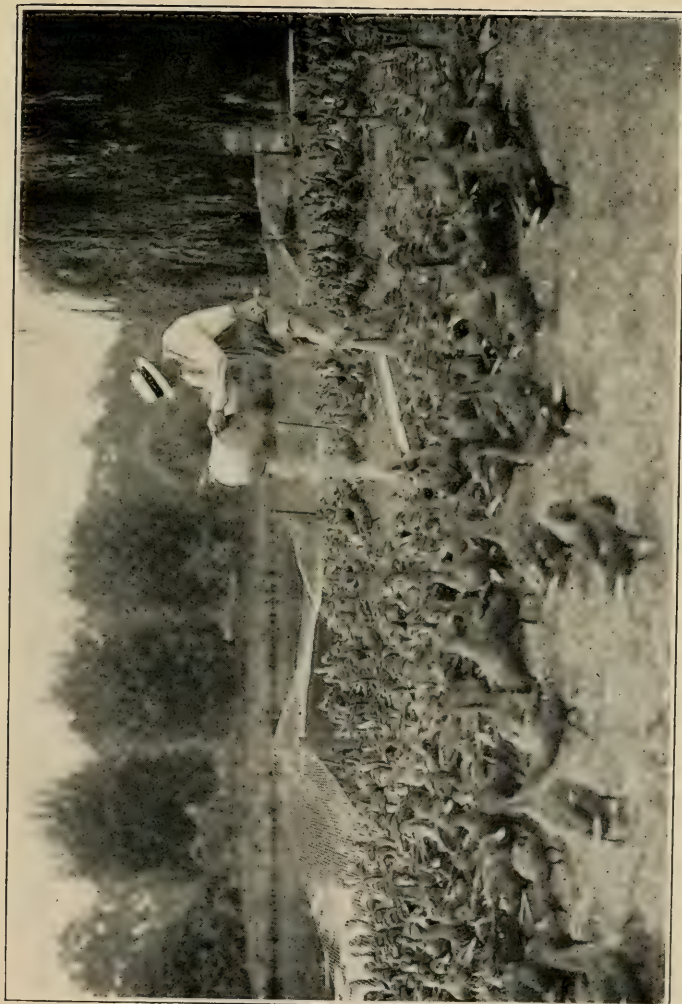
As the ducks passed the sweet corn they jumped up and plucked at the ears, sometimes taking a little corn from a cob and passing on and at other times pulling down a stalk and eating the young grain more freely. Like chickens, they destroyed more than they ate.

When I sent my setters out after the ducks the dogs often made a detour and, circling about, pointed the ducks from the side of the garden farthest from the house. As the dogs drew up close, the ducks would take wing and fly to the kitchen door, where they knew they were safe. These ducks, of course, were too tame, but they seemed to be much wilder when away from home. They made excursions to a bay a mile from the house and often were gone for hours.

I have no doubt that a patch of cucumbers and melons

planted near a pond on the preserve and allowed to run wild would prove especially attractive to the ducks and that it would not only tend to keep them at home, but out of mischief. Since wild ducks fly well the ordinary wire about a garden, used to keep chickens out, would be no barrier to them, but some plan should be devised to keep them out of gardens when they are reared on country places. Probably my ducks were not fed enough. If they are not permitted to become too tame it would be an easy matter to scare the ducks away and to let them know that the place was not safe, and by providing some similar green foods in more accessible and safer places they, no doubt, could be taught to stay out of the garden.

The English duck preservers and gamekeepers all advise that ducks reared under hens be not taken to the water until they are seven or eight weeks old. They should have water to drink in shallow pans and plenty of it. It is well to put some sand in the water and to scatter sand and fine grit about where the ducks can always find plenty of these necessary materials. The young ducks are infatuated with the water, and the theory is that without an aquatic mother to regulate their bathing and to lead them out at the proper time the ducklings stay in too long, like some human youngsters. Young ducks are liable to become chilled after being in the water too long, and they are subject to cramp. It is for this reason that all the authorities, including the gamekeepers, who are the best authorities, agree that it is best to keep young ducks which are reared under hens out in the field and away from any water until they are at least seven or eight weeks old.



DINNER TIME
Young Mallards on a New Jersey Preserve

Mr. De Visme Shaw says the young of wild ducks are as subject, or almost as subject, to cramp as are those of their domestic relatives, and the same care in keeping them from water must be exercised. Whatever kind of vessel be used, it should give the birds easy access to the water for drinking purposes, while at the same time preventing them from wetting their down. He recommends a framework made in the shape of a gardener's hand-light and covered with galvanized netting—the cover being placed over a shallow earthenware baking dish—a most satisfactory contrivance.*

The brood of ducks in charge of a duck should, of course, be left to her management. She will take them out on the pond for a short swim, and it is a beautiful sight to see the mother with her troop of cute little ducklings swimming behind her, or often in advance, the last named no bigger than tennis balls. The proud matron will make the excursions short at first and will soon have the young birds out on a sunny bank and often under her warm body.

Ducks are fond of seeking the shade, especially in the afternoon, when they usually take a doze. About 4 o'clock they begin to move about, afoot or awing. I often observed my ducks dozing in the shade of the house or trees, but at 4 o'clock promptly they marched forth, usually to raid my garden. As they passed my studio window I often called to the children to ascertain the time, asking them if it was 4 o'clock. The ducks were very accurate.

The coops should be moved a few feet daily to give the young ducks fresh ground for their feeding places.

*"Wild Fowl." By De Visme Shaw.

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The young ducks are very fond of flies, grasshoppers, and other insects, and the more of this food they can obtain the better. Captain Oates says his young ducks ate bees alive without ill effects.

When the ducks are two or three weeks old they may have some wheat or cracked corn, which should be served wet or placed in the water. Barley and corn may be added to their bill of fare a few weeks later. When eight or nine weeks old (the time depending on the weather) the ducks are taken to the water, and then they can be fed on grain only. Cracked corn is, probably, the best food. They will procure a variety of green foods, insects and much other food of various kinds about the pond or lake.

In places where wild rice, acorns and the other natural foods are plentiful the ducks will require very little feeding. One meal of grain a day should be sufficient to hold them.

IX

YOUNG DUCKS ON THE POND

WHEN the young ducks are taken to the water, after they are eight weeks old, the danger of losses due to disease and to certain kinds of vermin may be said to have passed. All animals thrive best when given much liberty, and the young ducks should grow rapidly in their new surroundings. They should, of course, be properly looked after and protected from vermin, and they should be fed at first two or three times daily with wheat or cracked corn, to which may be added a little of the prepared duck meal, the amount depending upon the amount of natural food they may be able to procure about the pond.

The place where they are turned down should be a grassy field, sloping to the pond, with some willows or other trees at a little distance from the water.

The field may be wired to keep out stray dogs, cats, and rats and other vermin, and the wire may be extended to include some water in the pond. By feeding, the ducks can be taught to use this safe field, although they will fly out and explore the pond and often the country in the vicinity. Ducks are great wanderers, unless they be kept too tame for sport, and they may

take a flight to some water at a distance from home, but they will be sure to return at the feeding time, or if alarmed, and if a horn or dog whistle be used and sounded before they are fed they will learn to come to the sound.

I discovered this fact by accident and have since seen it mentioned in the English magazines. Some dusky ducks which I reared in my yard were always on the lookout at feeding time and often came to the kitchen door and made loud demands for my appearance. I used to feed some setters there and in order to teach them to come at the sound of the whistle I often blew it just before feeding them. The ducks quickly associated the sound of the whistle with my appearance with the food, and often flew swiftly to the doorway and took the food I threw down for the dogs before the last named arrived. These birds were quite tame, of course, and were not afraid of me or of the dogs, but they could fly well and often explored the country round about and went out to a bay a mile distant, as I have said, where they remained for hours and took their chances of being shot in the open season. I feared they had gone for good the first time they went away. They were much tamer than ducks should be kept on a game preserve.

It is a singular fact, which seems almost incredible, that ducks which are tame in the presence of their owner or in a locality where they know they are safe, often will be as wild as any wild ducks when a stranger appears or when they are on dangerous waters.

Mr. Charles C. Townsend, of Colorado, wrote the following story about some wild ducks for Mr. Shields, the editor of Shields' Magazine, which well illustrates this



AFTER DINNER—YOUNG MALLARDS RETURNING TO LAKE

point: "One mile north of the little village of Moses, Colorado," he says, "lives the family of J. C. Gray. On the Gray ranch there is an artesian well which empties into a small pond about 100 feet square. This pond is never entirely frozen over, and the water emptying therein is warm, even during the coldest winter.

"Some five years ago Mr. Gray secured a few wild duck eggs and hatched them under a hen. The little ducks were reared and fed on the pond. The following spring they left the place to return in the fall, bringing with them broods of young; also bringing other ducks to the home where protection was afforded them and plenty of food was provided. Each year since the ducks have scattered in the Spring to mate and rear their families, returning again with greatly increased numbers in the fall and again bringing strangers to the haven of refuge.

"I drove out to the ranch, November 24, 1902, and found the little pond almost black with birds and was fortunate enough to secure a picture of a part of the pond when the ducks were thickly gathered thereon. Ice had formed around the edges, and this ice was covered with ducks. The water was also alive with others, which paid not the least attention to the party of strangers on the shore. From Mr. Gray I learned that there were some 600 ducks of various kinds on the pond at that time, though it was then early for them to seek Winter quarters. Later in the year, he assured me, there would be between 2,000 and 3,000 teal, mallards, canvas backs, redheads and other varieties, all perfectly at home and fearless of danger. The family have habitually approached the pond from the house, which stands on the

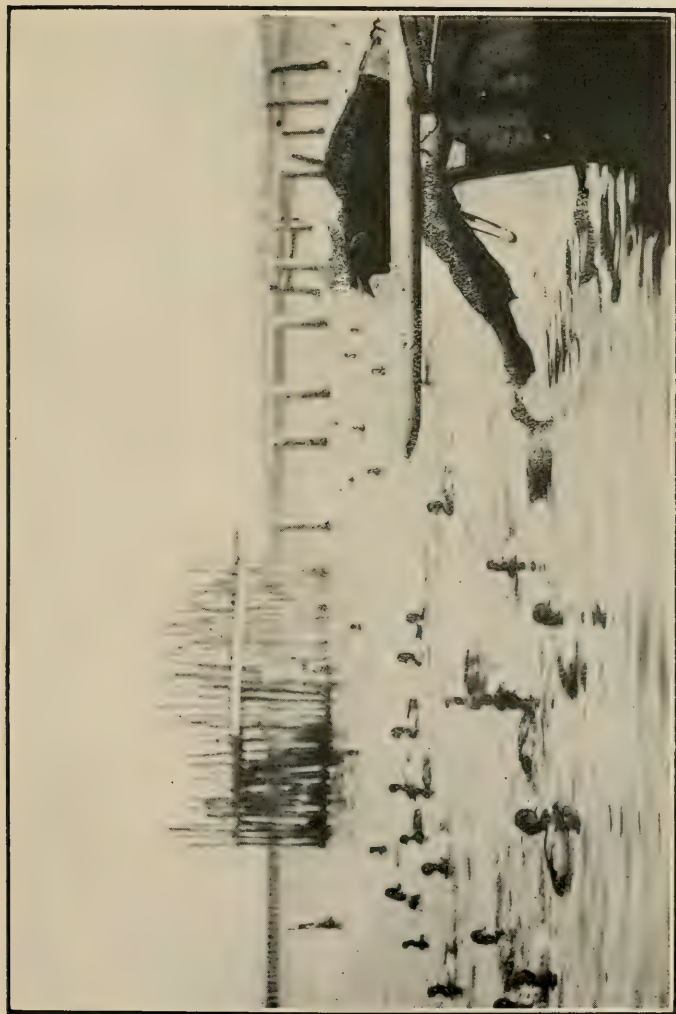
south side, and should any person appear on the north side of the pond the ducks immediately take fright and flight. Wheat was strewn on the ground and in the water, and the ducks waddled around us within a few inches of our feet, paying not the least attention to us or to the old house dog which walked near.

"Six miles east of the ranch is San Luis Lake, to which these ducks travel almost daily while the lake is open. When they are at the lake it is impossible to approach within gunshot of the then timid birds. Some unsympathetic boys and men have learned the habits of the birds and place themselves in hiding along the course of flight to and from the lake. Many ducks are shot in this way, but woe to the person caught firing a gun near the home pond. When away from home the birds are as wild as other wild ducks and fail to recognize any members of the Gray family, while at home they follow the boys around the barnyard, squawking for food like so many tame ducks.

"This is the greatest sight I have ever witnessed and one that I could not believe existed until I had seen it. Certainly it is worth traveling many miles to see."

The following accounts of wild ducks in Florida and elsewhere, with the remarkable picture of ducks at Lake Worth, which was sent to me by Dr. Dutcher, the distinguished President of the National Association of Audubon Societies, also illustrates this peculiarity of wild ducks.

The picture was published by the Association in an educational leaflet and Mr. Forbush, who wrote it, says: "At Titusville, Florida, where no shooting is allowed near the hotel or wharves, the wild ducks from the river



WILD DUCKS AT LAKE WORTH, FLA.

become so tame that they swim about among the boats like domesticated fowl and will even come out on the lawn near the hotel. These same ducks when out on the river beyond the 'dead line' are as wild as the wildest.

"At Lake Worth, Florida, the same conditions prevail, and the scaup ducks swimming in the lake become so confiding that they may be fed from the hand. In the ponds of the Middlesex Fells reservation, near Boston, Massachusetts, where gunning is prohibited, the black ducks have greatly increased, and some now nest in the vicinity of Boston.

"When the State of New York first prohibited Spring shooting, breeding black ducks were rare on Fisher's Island. A few years later there was good shooting on the island each Fall because of the ducks that were reared there. Dr. Shaw, who was rearing wild ducks near New Bedford, Massachusetts, asked the farmers near his place to post their land and prevent shooting as a means of protecting his ducks from poachers. This was done, and within two years wild black ducks began breeding on the farms all about."

A friend of mine who reared some wild mallards near a pond in Maine informed me that one of his wild ducks came in the house. These ducks could fly well, and some of them were shot when on a visit to a neighboring lake. Ducks on a preserve often are quite tame in the presence of their gamekeeper, but take wing when a stranger approaches. This is as it should be. I was talking with a gamekeeper one day, at Allamuchy, New Jersey, when some of his ducks came in, flying high over the tree tops. They headed to the wind and were descending to the little pond by which we were standing,

when they discovered my presence, and with loud squawks climbed high in the air and soon were out of sight. "They will come back all right," said their keeper.

Many wild ducks now are bred in the New York Zoological Park and in Central Park, New York. These birds have learned that they are safe in the presence of visitors to the parks, and, although they fly about and some, no doubt, desert, they are easily approached. Wild ducks which visit ducks on the preserves soon become comparatively tame in the presence of the game-keeper. The danger is not that the ducks will be so wild as to desert when they are properly looked after but that they may become too tame for sport. They should be shot, as we shall observe later, when they are away from the pond where they are fed.



PIN-TAIL EGGS



WILD DUCKS IN CENTRAL PARK

Photograph by the Author

X

THE NATURAL ENEMIES OF GAME

THE natural enemies of game birds collectively are termed vermin by the gamekeepers. It is a singular fact that the word "vermin" was almost unknown in America and was rarely, if ever, used in our sporting literature until I wrote a paper on "Game Bird Enemies" for *The Independent*, which was published March 5, 1908.

One of the chief causes for the rapid disappearance of our game is that it cannot stand the ravages of vermin and shooting at the same time. The word vermin often is used in the English sporting magazines and books, and the importance of controlling the enemies of game in order to make a place for the shooting often is discussed. "To destroy vermin is to preserve game" is a familiar English maxim, and the gamekeepers know that they cannot preserve vermin and game on the same field and show good shooting.

Dr. D'Arcy I. Hamilton says: "To show a good head of game on an estate the place must be cleared of vermin, and there is no time like the close time for this. The professional keeper knows this and knows how to accomplish it."

Mr. Owen Jones, an Oxford graduate who selected gamekeeping as his profession, says: "'Let the keeper look after the vermin and the game will look after itself,' is a saying which has stood the test of time. There is no more interesting phase of a keeper's work than the circumvention of vermin. Dull indeed would it be on a shoot where there is absolutely no vermin; one might as well use a gun which mechanically prevented missing. Though I had to do a lot of game shooting, I enjoyed the all around sport with vermin better. Often have I thought that I would like to get a keeper's berth where vermin teemed. I do not mean a place swarming with rats and rooks, but holding a good old fashioned stock of all sorts of vermin."*

The naturalists are right, no doubt, in saying that many species of vermin are beneficial and that they do not do as much harm as some gamekeepers imagine they do. Laws, however, which prohibit the killing of game enemies should not apply to game farms and preserves. The matter of the control of harmful species should be left to the game breeder. It would be quite as logical to say that the shepherd must not kill the wolves which destroy his flocks as it is to say that the breeder of game must not control the enemies which kill his game.

We should remember that it is easy to distinguish what game enemies are injurious and that it is not necessary or even possible to absolutely destroy even the most harmful species. This I regard as fortunate, since I enjoy seeing an occasional sly fox about and the graceful falcon sailing overhead or striking his quarry. It is an easy

*"Ten Years of Game Keeping." By Owen Jones. London, Edwin Arnold, 1909. Longmans, Green & Co., New York.

matter to make game so abundant that some of it can be spared to feed an occasional enemy.

There is no other cause for the decrease of the wild fowl, which is of more importance to American sportsmen than their destruction by vermin, excepting, of course, the draining of the ponds and marshes, which amounts to a total annihilation in the places which are drained.

The relation of the game to its natural enemies and the laws which govern nature's balance are well understood by game preservers. Game preserving is highly scientific. Without it evidently it is certain, in America, that we cannot have good shooting save in the more unsettled regions. When we undertake it there can be no doubt that the game can be kept abundant in the most densely populated regions, although thousands of birds be shot every year. This has been proven in England everywhere and in many places in the United States where the experiment has been tried.*

All forms of life, it is well known, tend to increase with such great rapidity that a very few of any species soon would increase so as to overrun the earth were it not for the many natural checks to their increase. Darwin says: "Lighten any check, mitigate the destruction ever so little and the number of the species will almost instantaneously increase to any amount."

The converse of Darwin's proposition equally is true. When we add to the checks to the increase of game

*The best examples of game abundance on the upland are the quail preserves of North Carolina and the pheasant preserves of New England, New York, New Jersey, etc. There are a number of wild duck preserves in New England, New York and New Jersey, where wild fowl have been restored and made abundant.

"ever so little" we must expect the number of the species to decrease, and the proposition has been proven in America as conclusively as Darwin's statement has been proven in England. Our game has vanished because we have added an important check to its increase—shooting—without first removing some of the natural checks to its increase to make a place for the shooting. The English gamekeepers have removed the check to increase—vermin—as far as possible, and the guns shoot thousands of birds every year without causing a diminution in the number of the species.

The English sportsmen leave a remnant of game every year to restock the fields, just as vermin, under natural conditions, leaves a remnant for restocking, but in America we shoot the remnant and wonder why our thousand or more game laws don't work.

When any species of game becomes reduced in numbers and its natural enemies hold their own or become more numerous, the last named, evidently, are superabundant when compared with the game, and as a result of such conditions the game must decrease in numbers, even in the absence of any shooting. It survives with difficulty if it survives at all. The birds which survive often change their habits and become extremely wary, and they may, in time, show an increase, since it is a difficult matter absolutely to destroy any species. Ruffed grouse and quail have responded to laws prohibiting shooting for a term of years, and they have increased in numbers in many localities, but not in all. It is evident that the laws cannot restore them in counties where they have become extinct. It also is evident that they must again become scarce when shooting is resumed. The

prairie grouse no longer occur in hundreds of counties where once they were tremendously abundant, and the wild ducks are never seen on thousands of ponds and small lakes and streams where the shooting was fine a few years ago. The wild ducks cannot nest and successfully rear their young beside waters which are overrun with trespassers, and dogs, cats and rats, in addition to their natural enemies, which are sufficient to check their too rapid increase and to preserve nature's balance.

Even in Great Britain, where preserves are numerous, it has been found impossible to entirely exterminate vermin, and a continual war is waged against game enemies. The idea that it is not necessary or desirable to exterminate all vermin seems to be gaining ground. The Rev. H. A. Macpherson, a good game preserver and writer on field sports, has well said, "Vermin should not be extirpated root and branch, but common sense requires that they should be kept within reasonable numerical limits." Referring to a statement of an observer that he counted the remains of over thirty grouse under the branches of a large fir, which had been killed by a kite, Dr. Macpherson says: "Sorry should I be to do an injury to a British kite. But our personal feelings must not be allowed to overpower our better judgment, and the preservation of rapacious birds, however desirable from a scientific or philosophical standpoint, possesses some distinct drawbacks for game preservers."

A good rule to follow is to control the natural enemies of game only when they appear to be doing serious damage. A hawk trap recently has been invented in England which captures the hawks alive. The hawks which do very little damage and which are regarded as

beneficial birds can be released and the worst species destroyed.

Mr. Owen Jones, gamekeeper, also refers several times to the growing sentiment in favor of the idea that vermin should not be too closely controlled.

"I regret to say," he observes, "that the last surviving pair of magpies in the locality where I was keeping were picked up by a keeper (not myself). Utterly to exterminate birds so handsome may save a trifle of game for the gun, but surely such extremes of preservation can only bring upon the perpetrators the derision and disgust of all sane people. A judicious thinning of hawks and magpies is quite enough to satisfy the demands of any sportsman, and their extinction is bound to react to the detriment of the selfish few."

Mr. Jones makes a good point in favor of the egg stealing jay. No sane keeper, he says, would wish to be without a sprinkling of jays in his woods, for he has no more vigilant and useful sentinels. In a wood where there are jays, neither cat, nor fox, nor man, can stir without being spotted and proclaimed. Jays also take a somewhat uncalled for delight in mobbing a barn owl should it get abroad in the day time.

Although Mr. Jones lost hundreds of eggs every year by rooks, and little pheasants on the rearing field had to be guarded constantly, he does not favor the extirpation of the rook. "I love as much as anybody," he says, "their cawing at the coming of Spring when the daisies open wide." Mr. Jones also says: "Reviewing the vermin question as a whole—that is, first, What vermin prey largely on game? and, second, What creatures prey on it only occasionally?—I admit that there is much room

for improvement in the attitude of keepers. However, I am certain that since education means enlightenment and modern preservation and shooting demand keepers of better education than formerly, the time is not far distant when all keepers will be men of education, and, therefore, of enlightenment. In this way, and in no other, will come about a rational discrimination in the matter of creatures now so often slaughtered indiscriminately as vermin. What the thinking keeper of today resents is that all keepers should be tarred with the sins of individuals, but so long as the world lasts gamekeepers will continue to complain that there is no visible end to the vermin, whether it be clothed in feathers or fur."

I have quoted the observations of Dr. Macpherson and Mr. Jones at some length, since this matter of the control of vermin is of much importance in America just now, where many game preserves are springing into existence in every State in the Union. We may as well start right and learn to distinguish between the game enemies which should be controlled and those which are comparatively harmless. The reader should remember, however, at all times that there is a difference in predaceous birds of the same species and that the same species may act differently in different places or under different circumstances.

I have shot certain hawks, which are regarded as more beneficial than harmful, when they were in the act of taking game birds, and Mr. Thompson, a skilled keeper, writing for *The Amateur Sportsman*,* tells of performances of the little sparrow hawk on his rearing field near Chicago, Illinois, which would warrant the control of this bird in the way he describes.

**The Amateur Sportsman*, June, 1910.

XI

WINGED ENEMIES OF WILD FOWL

WILD ducks have many natural enemies, and in populous regions certain domestic enemies are added which are sufficient to upset nature's balance and to prevent an increase of the fowl, even in places where shooting is prohibited.

The enemies of wild fowl may be classified as winged enemies and ground, or furry, enemies. The winged enemies are the duck hawk and certain other hawks, eagles, crows, owls, gulls, herons, jays, magpies and sparrows. Mr. Thompson, a capable gamekeeper, mentions the red-headed woodpecker as an enemy of ducks and says: "I have shot this thief as he carried the egg of a wood-duck over my head, and I have seen him even rob the chicken coop."* It seems doubtful, however, if the woodpecker would do much harm, and since it is a useful and interesting bird I would not advise its destruction unless it appeared to be overabundant and was observed to do much damage.

Some of the other winged enemies of game, also, are useful and beneficial birds, and the game preserver always should bear in mind, as I have observed, the fact

*The Amateur Sportsman, 1910.

that it is not necessary or desirable to destroy them all. They should be controlled only so far as is necessary to permit the game to increase in numbers rapidly. In some places certain feathered enemies of game are not sufficiently plentiful to require much attention. Predaceous birds, however, are known to gather where food is abundant, and gamekeepers should not be prevented by law from controlling them when it becomes necessary to save the game birds on the rearing grounds.

The Eagle.—This magnificent bird of prey has been so nearly extirpated in the Eastern States that he does very little damage, and in places where it is rare no one should think of killing it, unless it does much damage. I would be inclined to let an eagle have a number of ducks, and I may say as much for several other predatory creatures when they are not numerous enough to do a great amount of harm.

I saw an eagle not long ago which was killed by the gamekeeper on a New Jersey preserve when it attempted to take his ducks, and on an adjoining preserve the gamekeeper has a mounted eagle in his cottage which he shot when it was preying upon his pheasants.

In certain parts of the West eagles are fairly abundant, and a number of eagles should not be tolerated in the vicinity of a duck pond any more than a pack of wolves should be tolerated in a sheep fold. Laws intended to protect vermin for sentimental or for economic reasons should not apply, as I have said often, to the breeders or preservers of game.

In most parts of its range the bald eagle feeds more largely on water fowl than on any other kind of birds.

In the pursuit of this game this eagle employs great strength and skill, to which it frequently adds no small amount of strategy. Geese, brant and swans, owing apparently to their large size, are its favorite food.*

Mr. William Brewster says geese and brant form the favorite food of the eagle, and the address displayed in their capture is very remarkable. The poor victim has apparently not the slightest chance for escape. The eagle's flight, ordinarily slow and somewhat heavy, becomes, in the excitement of pursuit, exceedingly swift and graceful, and the fugitive is quickly overtaken. When close upon its quarry the eagle suddenly sweeps beneath it, and, turning back downward, thrusts its powerful talons up into its breast. A brant or duck is carried off bodily to the nearest marsh or sandbar, but a Canada goose is too heavy to be thus easily disposed of. The two great birds fall together to the water beneath, where the eagle literally tows his prize along the surface until the shore is reached. . . . The royal bird seems to find little difficulty in overhauling the swiftest flying ducks.

The eagles are said to be numerous on the Atlantic coast near Cape Charles in the Winter. Mr. Nathan Cobb informed Mr. Brewster that on several occasions he had seen as many as eight at once.

The gray sea eagle, about the same size as the bald eagle, is also fond of wild fowl, but in America it occurs only in Greenland, on the shores of the Cumberland Sound and on the Aleutian Islands.†

The golden eagle, often called the mountain eagle, is

*"The N. Am. Eagles." Bulletin 27, Biological Survey, U. S. Dept. Agr.

†Bulletin 27, Biological Survey, U. S. Dept. Agr.



EGG-STEALING CROW

From a Copyrighted Photograph Sent to The Amateur
Sportsman by Anson O. Howard.

found chiefly in the Western and North Western parts of the United States. It takes many rabbits and upland birds, especially sage grouse and sharp-tailed grouse, but it does not seem to take so many ducks and other wild fowl as the bald eagle, probably because the ducks are not so abundant in the mountainous regions it prefers. Mr. R. MacFarlane, however, mentions ducks as a part of the regular food of this eagle in the region of the Anderson River, Mackenzie, and Mr. L. M. Turner makes a similar statement regarding the coast of Alaska.*

The Crow.—I am strongly inclined to regard the crow as one of the worst winged enemies of the wild ducks in places where crows are abundant. This wary bird has become superabundant in many places since the game has decreased while the crow has increased in numbers. Crows destroy both the eggs and the young birds. All of the gamekeepers regard them as very destructive. The crow has been observed in the New York Zoological Park taking young ducks, and on many farms he has been seen to take the eggs and young of poultry.

Mr. Price, at the Fells reservation, in Massachusetts, raises both wild and domesticated ducks. He says the crows took five out of seven young ducks in one day. In June about one hundred mallards were turned out on a small pond. Ducks lay their eggs very early in the morning, and every morning crows were seen carrying off eggs. Mr. Price says they took about fifty each week, carrying off altogether from eight hundred to one thousand eggs during the season, taking about all the eggs laid by the ducks. Crows are attracted by game when it

*Bulletin 27, Biological Survey, U. S. Dept. Agr.

is plentiful, and a gamekeeper at the Illinois game farm killed 2,410 crows in one season.

The crow destroys the nests and young of all birds, including wild turkeys, and the evidence against him is conclusive. The reader who wishes to pursue the subject will find it fully discussed in an article on the crow in *The Amateur Sportsman* for March, 1910, where the picture here reproduced and some others were first published.*

Various methods are used to control the crows. They can be decoyed by the use of crow calls and shot, and some keepers are very expert in imitating their cawing without the aid of an artificial call. I saw the keeper on a North Carolina preserve call crows from a great distance and shoot them from his ambush behind a little cedar tree.

They are attracted by a stuffed owl, "the bugaboo" of birds, placed on a pole or tree, and an owl especially made for this purpose, which flaps its wings and turns its head when a string is pulled, proves very deadly to all feathered enemies of game, provided the gunner be a good shot and well concealed. These decoy owls can be purchased from Von Lengerke & Detmold, of Fifth Avenue, New York, and the price is \$25.

Mr. Thompson says: "Crows are very destructive to the eggs and young of almost every species of game, and constant war must be waged all the year around if the game is to be saved. Crows are especially fond of young ducklings, and where these are raised on the farm means for their protection must be devised. The best method of

*The photographs which are copyrighted were sent by Mr. Anson O. Howard of Massachusetts.



DECOY OWL

Photograph by Justus Von Lengerke

protection is to kill the crows. There are many methods of doing this. Poisoned entrails and poisoned eggs can be used to advantage, where this is lawful, and trapping can be done to baits as described for hawks. Trapping in the snow by means of blood spilled on the snow and a steel trap placed nearby, destroying the nests in the breeding season, waiting for the crows with shotguns as they come in to roost, all are effective methods of destruction. The watchword when crows are about is, keep killing them, especially where the flocks run up into the thousands."¹

The crow does a good part of his nefarious work very early in the morning, when he seems to know that people are abed. His hunt at such times is a still hunt, and he comes close to buildings where he would not venture later in the day.² Mr. Judd describes a crow which came daily into a barnyard and sat on a fence, evidently waiting until a hen had laid an egg, when at once he made off with it.³

The Hawks.—It is admitted that there are good and bad hawks, but even some of the good ones will require watching, since they readily acquire a fondness for game and eggs when they are abundant and easily obtained. The worst enemy of the ducks among the hawks is undoubtedly the Peregrine falcon, or duck hawk. This bird, like some other hawks, seems to hunt for pleasure and often kills more ducks than it can eat.

I have shot them on many marshes where they were thus engaged. Upon one occasion Mr. George Shiras, 3d, went with me to the preserve of the Ottawa Club, near

¹ The Amateur Sportsman, June, 1910. ² Ib. March, 1910. ³ Bulletin, "Birds of a Maryland Farm." U. S. Dept. Agr.

Sandusky, Ohio, before the season opened, to make some photographs of wild ducks. He had placed a number of wooden decoys before his blind when a hawk struck one of them and carried it some distance from the water. Mr. Shiras had two cameras and secured a picture of the hawk as it struck. He tried for another picture as the bird soared aloft carrying the decoy, with its weight hanging down, but his aim was bad, and the hawk did not appear on the plate.

When I examined the decoy I observed that the hawk's talons had been sunk deeply into the wood.

The hawks can be controlled by shooting them from ambush, and many can be killed by steel traps placed on poles. On some preserves very small poles are used, and these are stood in pieces of drain tile inserted in the ground. The pole when so arranged easily can be taken down to set the trap. One preserver informed me that he stood his poles up against the fences.

On one occasion, on a Western marsh, a hawk was observed to follow a flock of teal and strike down three of them in succession. He was hunting wantonly and flew away without stopping to eat one of the ducks.

When ducks are breeding wild in the marshes they are comparatively secure from many dangerous hawks which are not often seen in such places, but when the ducks are reared on farms the hawks which are injurious to poultry must be controlled. The worst hawks undoubtedly are the Goshawk, Cooper's hawk and Sharp Shinned hawk, but the hawks which are regarded as more beneficial than harmful should be observed, and when they gather in large numbers or when a single hawk persists in taking many young ducks it should be destroyed, of

course, if the owner of the place prefers ducks to hawks.¹

Dr. Field, chairman of the Massachusetts Commission of Fisheries and Game, says that the marsh hawk is very destructive to the grouse on Martha's Vineyard.

The reader will find the hawks discussed at length in a bulletin issued by the United States Department of Agriculture,² but in reading it he should remember that the conclusions stated are founded largely upon stomach examinations and that such evidence is not always reliable. Since game is everywhere very scarce no doubt many of the specimens examined had no chance to eat game, and it does not follow that any of the hawks would not take young ducks or other game in places where the game was abundant. The safe rule is to observe what the hawks are doing on the rearing field and to act accordingly.

Gulls.—Some gulls undoubtedly take eggs and young ducks, but all gulls, even in the same flock, it is claimed, are not equally bad. A gamekeeper on an English preserve, who observed that gulls were destroying his ducks, killed the pair which were thus engaged, and he is reported to have said that the other gulls did no harm thereafter.

The Rev. H. A. Macpherson says some gulls are very destructive to grouse as well as to ducks. "The lesser black-backed gull," he says, "is a shameless gourmand and does a great amount of mischief. He likes the young

¹ The marsh hawk is classed as a beneficial hawk by ornithologists, but I shot one which had a quail in its talons as it flew overhead, and Audubon says when impelled by hunger it will attack partridges, plovers and teal. It should be killed only when it appears to be preying on game. ² "Hawks and Owls." Bulletin, U. S. Dept. Agr.

wild ducks better than the tiny grouse, but nothing seems to come amiss to his hungry maw. It occasionally happens that an old herring gull takes to felonious practices. They suck poisoned eggs eagerly, and I have seen individual birds beating the hill day after day searching for grouse nests. I have also known the herring gull to carry off young chickens from a cottage door.”*

The Owls.—The great horned owl and the snowy owl are the enemies of game birds and poultry, and where ducks are reared near woods they no doubt would take some of them. The owls are not abundant, however, in most places, and the game preserver has little to fear on their account. They are interesting birds, and I would hesitate to destroy them unless it clearly appeared that they were doing much harm. The only owl which visited me when I made my experiments with wild ducks was the little screech owl, and I had no losses due to owls.

John Burroughs calls the owl the bugaboo of birds, and there can be no doubt that he creates a great disturbance whenever he appears. The reader will find the merits and demerits of owls fully discussed in the bulletin on “Hawks and Owls” issued by the United States Department of Agriculture, but, since some of the specimens were taken in places where there was no game for them to eat, the evidence, which was based on stomach examinations, is not conclusive, as I have suggested. Mr. Forbush, also, has well said such examinations represent only one meal. .

English Sparrows.—The sparrows are a nuisance on the game preserve, since when they are abundant they

*“The Grouse.” By H. A. Macpherson and others. Longmans, Green & Co.



GOOD BAG OF CROWS SHOT OVER A DECOY OWL

Photograph by Justus Von Lengerke

devour much food which is intended for the game. They have been known to destroy the eggs of wild ducks, and they undoubtedly drive many desirable small birds away. They easily can be shot and trapped, and their nests should be destroyed as soon as made.

The Magpie.—The magpie in the West and in parts of British America is an enemy of game which should be controlled closely. One of my correspondents writes that in Washington (State) he has known the magpie to destroy the nests of the prairie grouse. I have had other reports about the damage done by these birds in the West and in some of the Canadian Provinces.

The heron is said to destroy young ducks in England, but I have no reports about this bird in America. When visiting a duck preserve in New Jersey I heard a shot fired and saw the gunner across the pond. I asked the gamekeeper what was shot, and he said it was a crane, and added that its mate had killed several ducks and was in the act of killing one when he shot it. I regret that I did not see the bird, since the crane is a rare visitor in New Jersey. Probably it was a heron.

The Jay.—This bird, as I have observed, is beneficial to gamekeepers. It undoubtedly is an egg stealer, but probably it takes the eggs of small birds for the most part. Jays should not be permitted to become overabundant, since it is desirable to preserve the smaller song and insectivorous birds on the farms included in a preserve, as elsewhere.

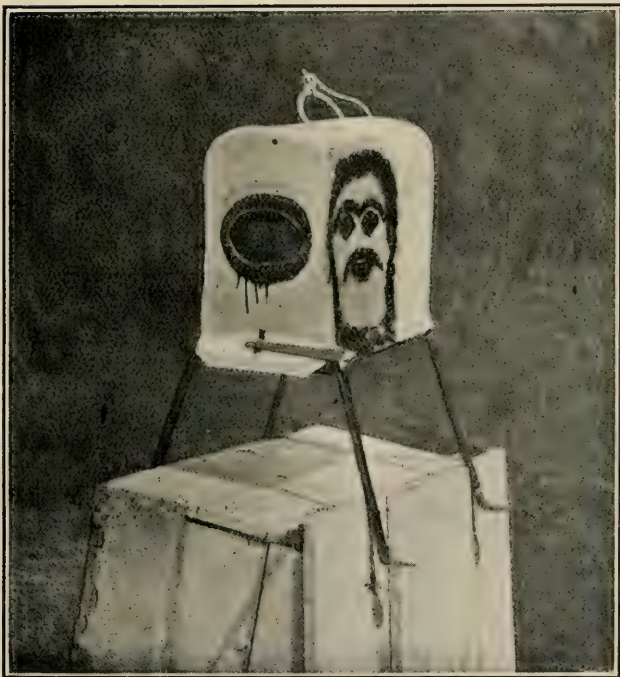
XII

THE GROUND AND WATER ENEMIES OF WILD FOWL

THE principal ground enemies of game birds are: Foxes, wolves, minks, weasels, skunks, raccoons, squirrels, snakes and moles. In settled regions roving dogs, cats and rats are added to the list, and these become often the worst enemies of wild fowl.

In addition to the enemies named, frogs, turtles and certain fish also are known to take young ducks.

Mr. Robert B. Lawrence told me that a frog in his brother's duck pond was killed which had devoured a young sprig-tailed duck, and since many young wood-duck had disappeared, unaccountably, he believed the frogs had eaten them. A correspondent of *The American Field* confirms the destructive propensities of the bull-frog. "We had," he says, "quite a number of tame mallard ducks, which hatched their eggs in the woods, and the first we saw of their young was in the water with their mothers. We noticed the number of the ducklings decreased quite rapidly and found on investigation that when they got near the shores, one after another were pulled under the water by large frogs, which drowned and then swallowed them. To preserve them, whenever



A SCARE-FOX

The Scare-fox has shutters which are run by clockwork so as to fall every ten minutes, causing the light to flash in three directions.

we saw a new brood on the water, we captured and kept them in the chicken yard until they were quite large enough to care for themselves."

Pike also take young ducks, and turtles, where they are abundant, are a serious check to the increase of ducks.

The Fox.—In places where foxes are numerous undoubtedly they destroy many game birds as well as poultry. Mr. F. E. R. Fryer, an English authority on game preserving, says: "Although I am of the opinion that in the long run it is best not to attempt game preserving on a large scale in a fox-hunting county, just as I think it is a mistake to try to start a pack of hounds in a good partridge county, a few hints as to the best way to protect the partridge from the fox may be of interest to some, who, though all in favor of fox-hunting, like occasionally to take a gun out." Mr. Fryer insists that it is necessary to have a good keeper to control foxes and that he must know every nest and endeavor to prevent them getting at it.

The rearing field for ducks should be wired, and traps for foxes should be distributed liberally outside the wire and in all likely places. Dogs on the preserve are useful to keep foxes away, and where foxes are numerous they should be hunted with hounds and destroyed. The gamekeeper does not hesitate to shoot a fox, in America, but in England often he is ordered to preserve the foxes, and in fox-hunting counties the gamekeeper's work is more difficult than it is in places where foxes are controlled. An abundance of rabbits is desirable, since foxes are fond of them and find them easier to catch than game birds are. Owen Jones calls rabbits the fox's bread and

butter, and adds, "It would be a sorry prospect for keepers, game and foxes if rabbits were exterminated, for they are the buffers of peace in the community of the woods."

Wild ducks are in little, if any, danger from foxes when they are taken to the pond, and a low wire such as is pictured in the illustrations of ducks on the water seems to afford protection from many kinds of ground vermin. Anything attempting to get over the wire easily is seen or heard, and the ducks can take wing or swim out of danger. Islands in the ponds are very desirable, as I have observed. They are safe refuges for the ducks from many kinds of vermin, including cats.

Wolves.—With the exception of the coyote, wolves are unknown in places where ducks are preserved or where they are likely to be preserved before the wolves are extirpated. I have seen the sly coyote hunting ducks about the reedy banks of a Western pond, and once I stopped one just as he was about to pounce on some young mallards. Where coyotes occur they should be poisoned, shot, trapped or otherwise controlled, and the nesting and rearing fields of the ducks should be wired against them.

Minks and Weasels.—Both the mink and the weasel are difficult enemies to deal with. These animals seem to hunt wantonly, and they destroy more than they can eat. The mink has been known to kill more than fifty fowls in a night. Winged vermin is easily seen, and on this account it is more easily controlled. But the mink and the weasel, like other furry vermin, are seldom seen, and often they are hard to exterminate. A good game-keeper quickly will detect their presence, and he should

know how to trap them. They are taken with common steel traps. Minks can be hunted with a good dog, and I read an account not long ago of a Western hunter who found them in the sloughs with the aid of a halfbreed pointer trained to hunt them.

The Raccoon.—Mr. S. Evans, the father of the proprietor of the Wallace Evans Game Farm, told me that the “coons” were sometimes a pest. They succeeded in destroying young ducks on the game farm notwithstanding the fact that the place is heavily trapped and guarded by competent keepers.

The Skunk.—The naturalists regard the skunk as a beneficial animal, and I doubt much if it destroys as many eggs and young birds as some people think it does. There can be no doubt, however, that sometimes it takes the eggs and young of game birds, and it seems likely it might develop a decided taste for them in places where such food was abundant and easily procured. Skunks are easily trapped and shot, and a good gamekeeper should have little difficulty in keeping them down when they are observed to be harmful.

Snakes.—Both the rattlesnake and the blacksnake have been known to take quail and their eggs, and I have no doubt they would take young ducks. It is not a difficult matter, however, to keep snakes out of a well wired rearing and breeding field, and easily they are destroyed with the aid of a terrier in places where the cover is not too heavy. A gamekeeper once gave me an amusing account of the killing of a blacksnake by one of his terriers.

The Mole.—The late Mr. C. J. Cornish, in Shooting, says: “I remember a case in which a mole made its run

through the bottom of a nest (a very frequent cause of mischief where nests are not known of and looked at periodically). A good number of the eggs had disappeared down the hole, and after various attempts to stop the run had failed, I moved the nest over a yard away without the removal having any apparent effect on the bird" (the gray partridge).

Turtles.—Where turtles are abundant they are among the worst enemies of young ducks. They are difficult to control on large waters, but they are easily removed from small waters. Many turtles can be shot, both in the water and on the banks, and they can be captured in various ways with nets and baits. It is highly important to extirpate them when they are observed to be feeding on young water fowl.

Pike and pickerel are known to take small ducks, and these fish should be removed from the ponds where the young ducks are reared.

The muskrat has been considered an enemy of ducks, but most sportsmen and naturalists are of the opinion that this interesting animal does little, if any, harm on the duck preserve. The fact that ducks often are seen swimming about in places where muskrats abound would seem to indicate that they are not alarmed and that they do not regard the muskrats as their enemies. This subject was fully discussed in *The Amateur Sportsman* for March, 1909. The evidence there presented is decidedly in favor of the muskrat. The muskrat might be made profitable on some duck preserves.

In settled regions many of the natural enemies of game, with the exception of crows and certain hawks, often are not sufficiently abundant to do much damage,

and where they are few it does not seem wise to destroy them, excepting, of course, where they are observed to be doing serious damage. A mink or weasel which destroys a large number of ducks should be hunted down and killed at any season of the year. The gamekeeper and not a State game warden should decide the matter on private lands.

Where the natural enemies of game are few the domestic enemies often are very numerous and destructive. The cats are noted bird hunters; the dogs are fond of chasing birds and prevent their nesting; the rats eat not only young birds, but also the eggs. I have been surprised, when visiting American game preserves, to learn of the numbers of cats destroyed by the gamekeepers. In many places throughout America the cats are sufficiently abundant, undoubtedly, to prevent the wild ducks from nesting and rearing their young, even if the birds were not persistently shot by people living in the vicinity of the ponds and lakes. The cats seem to be increasing in many places, and many annually are turned down to shift for themselves, and quickly they become wild. They are skillful in taking birds.

It is not a very difficult matter for a gamekeeper to control the cats, since they are easily discovered and shot as they prowl about. They can be trapped with steel traps and hunted with terriers. I have seen a terrier make short work of killing a cat, and the terriers are useful dogs on the preserve, since they will destroy other ground vermin.

Some cats can be taught not to kill birds, and I have seen cats at gamekeepers' houses which walked about among the young pheasants and ducks without causing

any alarm. The gamekeeper quickly would destroy his cat and replace it with another if it exhibited any disposition to eat birds. Good cats I regard as exceptional. All the cats I have ever owned destroyed birds daily.

Rats undoubtedly are among the worst enemies of ducks. Captain Oates says they are the worst.¹ He took sixteen wild duck eggs from one rat hole. Fryer disposes of rats in five words, "Rats must be cleared out."²

The common brown rat was introduced in America about the year 1775, and despite the incessant warfare of man, it has extended its range and steadily increased in numbers. Its dominance is due to its great fecundity and its ability to adapt itself to all sorts of conditions. A compilation of all the methods of destroying rats practiced in historic times would fill a volume. One of the most effective poisons for rats is barium carbonate, or bayrites.³

Mr. Lantz, who prepared the bulletin cited, says the improved traps with a wire fall released by a baited trigger and driven by a coiled spring (sometimes called guillotine traps) have a marked advantage over the old forms, and many of them may be used at the same time. The traps should be baited with small pieces of Vienna sausage (wienerwurst) or bacon.

Mr. Lantz, in a second bulletin prepared for the Biological Survey, United States Department of Agricul-

1 "Wild Ducks." 2 "Country Life Lib. Sport, Vol. I., Shooting, p. 135.

3 "Methods of Destroying Rats." Farmers' Bulletin 297, U. S. Dept. Agr. This bulletin can be had upon application to the U. S. Agricultural Department, Washington, D. C.

ture,¹ says: "The rat is a most serious pest in game preserves. The propagation of game birds, both native and introduced, is now a promising industry in the United States. The rat has already proved itself a foe by destroying both eggs and young of pheasants. Abroad, the game preserver regards the rat as the worst enemy of game. A writer in Chambers' Journal says, 'In a closely preserved country at the end of an average year the game suffers more from the outlying rats of the lordship than from the foxes and the mustelines together. The solitary rats, whether males or females, are the curse of a game country. They are most difficult to detect, for in a majority of cases their special work is supposed to be done by hedgehog, weasels or stoats.'"²

The late Mr. William Carnegie ("Moorman"), one of the most distinguished sporting writers, who at the time of his death was the English correspondent of *The Amateur Sportsman*, says in his work on "Game Preserving:" "There is little doubt that of late years the worst vermin with which the generality of preservers have had to contend has been the rat. It has increased largely in numbers and in some districts become quite a plague, despite the extraordinary efforts made to deal with its ever-increasing depredations. It is unnecessary to speculate upon the probable cause of this remarkable increase. It is due entirely to the neglect of farmers, preservers and others to adopt adequate means to deal with the pest."*

Mr. Lantz says our native game birds in the wild state are less subject to rat depredations than imported species.

1 "The Brown Rat in the United States." By David E. Lantz. Bulletin 33, Biological Survey, U. S. Dept. Agr. 2 Chambers' Journal, Vol. 82, p. 64, January, 1905.

*"Practical Game Preserving." By William Carnegie, p. 349.

The nests of ruffed grouse are made in the woodlands, which rats seldom invade. The prairie hen and related species generally nest in places remote from the usual haunts of rats. The quail, or Bob White, however, often selects a nesting site within the Summer range of rats, and many a quail's egg reaches the maws of these animals. Nests of wild ducks, woodcock and other marsh birds are frequently destroyed by rats.

Ferrets and dogs are very useful in controlling them. Mr. J. C. O'Connor informed me that they were overrun with rats at a preserve in which he is interested, in Virginia, but that they succeeded in controlling them by the use of terriers and traps.

Roving dogs alarm the nesting birds and often chase and kill them. Some dogs are fond of eggs. Ducks cannot be expected to nest in a place where they are annoyed by dogs. It is not a difficult matter to shoot a worthless dog when he visits a preserve, but valuable dogs should, of course, be caught and held for their owners.

One of the worst fish enemies of ducks is the carp, not because it destroys the birds, but because it destroys their food—the wild rice and other aquatic plants. On the marshes owned by the Winous Point Club and by the Ottawa Club, near Port Clinton, Ohio, and in many other places, the carp have practically destroyed the wild rice which a few years ago furnished an abundance of food for countless numbers of wild fowl. The number of ducks which nest in these marshes or which visit them on their migration has been sadly decreased.

The carp destroy the plants by rooting them up, and in some places the ducks have been forced to abandon the waters where the carp have become abundant.

XIII

AMERICAN DUCK CLUBS

NEARLY all of the best marshes and the desirable lands about the ponds and lakes in the United States which are frequented by wild fowl during their migrations now are owned or leased by individuals and clubs.

The best shooting points about the Chesapeake Bay and on the outlying beaches also are controlled in the same way, and the number of duck clubs is increasing rapidly. For a time the shares in these clubs became more and more valuable as the years passed, until shares which cost a few hundred dollars or less when they were issued easily were sold for from \$1,000 to \$5,000 and perhaps more. The diminution of the flight, due to the decrease in the numbers of the ducks, has caused a decline in the value of the shares in some of the duck clubs, and in some instances the decline in value has been rapid.

The marshes about the great lakes in the United States and Canada are owned and controlled by many clubs. The center of abundance of these clubs is from Sandusky Westward and around the Western end of Lake Erie to the St. Clair Flats, where there are excellent duck clubs, both in the United States and in Canada.

The ducks were so abundant a few years ago that no effort was made to increase their numbers or to control their natural enemies. The shooting was kept up late in the Spring, after the ducks had mated and when many of them would have remained to nest, undoubtedly, had they been given a chance to do so. As long as the ducks were abundant the necessity for looking after them and increasing their numbers did not occur to anyone.

There are many small ponds on these club grounds which have desirable fields adjacent where the artificial rearing of ducks could be carried on to great advantage. Thousands of ducks could be produced every Spring at a very small expense, since they could be liberated when a few weeks old, and they would find most of their food in the marshes. The vanishing wood-duck, the teal and other fowl could be made to provide excellent shooting by the end of August and long before any migratory birds arrive from the North.

At the time of my visit to the Lake Erie group of clubs I observed that some of the natural enemies of the game were abundant. Hawks were often seen in the air, and on one occasion a hawk alighted on the head of a punter who sat motionless in the grass, the bird mistaking his old gray hat for a stump, no doubt. There were many rattlesnakes on the preserves of the Ottawa and Winous Point Clubs, and one of them crawled up on a log where I was seated sketching one day and coiled itself up beside me. I was somewhat alarmed when I discovered it, but easily killed it.

The unfortunate introduction of the carp has destroyed miles of splendid food—the wild rice—and Mr. Chamberlain, the Secretary of the Ottawa Club, recently wrote me



BLUEBILL SHOT AND PHOTOGRAPHED BY BONNYCASTLE
DALE

that they were now feeding tons of grain in the effort to induce the ducks to remain during the shooting season. It should not be a very difficult matter to wire some of the desirable ponds against the carp and to destroy all of those within the protected territory, when the wild rice could be restored, and soon it would grow as luxuriantly as it formerly did.

There are many duck clubs in the vicinity of Chicago and Northward at Fox Lake and other desirable places. The whole vast region along the Illinois River in the vicinity of Peoria and Havana is occupied, and there are hundreds of clubs about the marshy lakes of the Western and North Western States. On the Pacific coast the duck clubs already are numerous in Oregon and Washington and abundant in California from the vicinity of Sacramento South to Los Angeles, where there are literally miles of clubs.

There are a few clubs about the great reservoirs in Ohio, and there are many clubs in New England, especially in Massachusetts.

Along the Atlantic coast there are many insular clubs, which own for the most part the islands where their club houses are erected.

The Princess Anne, the Ragged Island and the Back Bay Clubs, a short distance from Norfolk, Virginia, mark the beginning of a long line of clubs (most of which have fine club houses), which extends Southward through Currituck Sound to the waters of the Albemarle and Pamlico. Many men act as guards to keep out poachers.

To the Southward there are many more clubs, notably those about the mouth of the Santee, in South Carolina, and the number is increasing.

The amount of money invested in lands, buildings and boats, including power launches and yachts, is tremendous, and the many thousands of gunners who own shares in these clubs should take notice of the fact that the wild fowl must decrease in numbers when their Northern nesting grounds are destroyed and that it seems certain that the ducks will visit the club marshes in much smaller numbers than they now do, provided the shooting continues to increase and nothing be done to cause an increase in the numbers of the game.

All of these club men, whose properties are situated to the Eastward of the Rocky Mountains, should take an interest, as I have said, in the "wild ducks' paradise," and they should endeavor to so arrange matters that the Northern breeding grounds be not all destroyed.

Some vast parks, containing miles of sloughs and ponds, should be set aside as duck refuges in "the ducks' paradise," just as the parks and big game refuges have been created for the deer and elk in the Western States. I believe this matter can be arranged easily and that it will be before long. I suggested the setting aside of some refuges for ducks (in "Our Feathered Game"), and some of the places I named have since been made national bird parks.* But this is not enough. The inhabitants of "the wild ducks' paradise" should be taught that it will pay not to drain many of the sloughs and ponds and that they can be profitably used as breeding places for the ducks. The people should be encouraged to properly look after the wild fowl on these famous breeding

*Stump Lake, N. Dak., is one of the most important wild duck refuges. See *Our Feathered Game*, p. 33.

grounds and to sell them alive for propagation and as food in the markets.

The duck clubs must learn, also, that they should create as well as destroy on their own marshes and that it is necessary to create before an army of guns can safely shoot any species of game in large numbers.

The employment of a few skilled gamekeepers, or even of natives living in the vicinity who know the habits of the furry and winged enemies of game and how to trap and shoot them, would be followed by a decided increase in the numbers of the game. This is especially true provided the shooting be discontinued at the end of February or early in March and even before those dates on certain ponds which should be set aside for breeding places.

It would be interesting and profitable also, at the Northern clubs at least, to undertake the hand-rearing of fowl on a large scale, and some species—the wood-duck, the Florida dusky duck, the mallard, the blue-winged teal and some others—could be propagated, no doubt, in large numbers in the South. I have seen the mallard breeding in the care of a gamekeeper as far South as North Carolina.

The duck clubs which may undertake to increase the ducks (I am pleased to observe that some recently have done so) should be encouraged by legislation, as I have often pointed out. They should be classed as breeders and permitted to regulate their shooting during a long open season, without State interference, and they should be permitted to sell some of the game alive for propagation or as food in the markets, under State regulation and to licensed dealers, of course.

In some places, notably in Illinois and California, a prejudice has existed against the owners of duck marshes. Those who have not secured ducking grounds often look with envious eyes upon those who are more fortunate. In the States named there has been much ill feeling in certain localities, and near Chicago some years ago this resulted in rioting and bloodshed on the grounds of the Tolleston Club. The marshes which were a bone of contention since have been drained and built up, and, of course, there is no shooting for anybody. Those who are hostile to the duck clubs should remember that the chances are that the grounds occupied by the clubs will be drained before they are opened to the public.

Common sense must regulate this matter eventually, and I am pleased to observe that the prejudice against those who preserve the ducks has disappeared in many regions. The courts have held, uniformly, that the owners of marshes have the right to exclude trespassers.

In some of the States ponds which contain over ten or fifteen acres are held to be public waters, but they are of little value to the public for duck shooting, since the whole neighborhood would rise up in arms if a duck ventured to alight on a public pond in a settled region. It is, of course, an easy matter to scare wild fowl away from such places. It would be far better if the game protective associations would devise some means for stocking such places with fowl and for regulating the public shooting so as not to drive the birds away. The lands about most of the ponds, however, are owned by individuals and not by the State, and in no State can trespassers shoot on inclosed and cultivated lands if the owner objects.

It is nonsense to say that the trespass laws should not be enforced or that they should be repealed. The owners of farms and cattle ranches in the West have the right to prevent the introduction of buffalo as "State" game. The farmers have prevented the introduction of "State" pheasants in some places, and the owners of duck lands prevent trespass.

The State can provide public parks for public shooting, but, as I have insisted often, it cannot license gunners to shoot up the farms or other lands owned by individuals who object to trespassers.

The duck clubs can do much to overcome the foolish prejudice which exists against them in some localities if they will become breeders of wild fowl and will purchase stock birds and eggs and undertake the artificial production of game of all sorts. If they will sell some of the game produced, so that the markets are fully supplied with game during a long open season, the people soon will uphold them, since they will appear to be beneficial to others besides themselves. Shooters who do nothing towards breeding game soon will find the shooting on public waters much improved, and all controversy should come to an end.

Mr. Frank Bonnett in a series of articles written for *The Amateur Sportsman* on "English Game Preserving," described the formation of a shooting club, or a syndicate, at they say in England, and gave the figures, showing that it does not cost much to have good shooting in England, where lands and shooting rentals are many times higher than they are in America.

I know some sportsmen who have fairly good shooting in America at a cost of from \$15 to \$25 per gun, and

they always will, unless those who are opposed to field sports succeed in prohibiting shooting at all times.

There are many places in America where wild ducks can be introduced and made plentiful, and any persons who wish to have good shooting can do so at small expense. The time has come to cease making new game laws in the hope of improving the sporting conditions and to do something towards restoring the game to the places where it no longer occurs.

XIV

TO FORM A DUCK CLUB, OR SYNDICATE

THE necessity for the employment of a gamekeeper when the restoration, propagation and practical protection of wild fowl is undertaken in populous regions is evident. The most expensive items incident to the rearing of wild ducks for sport are the wages of the gamekeeper and the food for the ducks. The shooting rental is a small item, comparatively, in America, since ground suitable for duck rearing can be rented for shooting purposes for a few cents per acre.*

When a farmer, or a sportsman residing in the country, undertakes to rear wild ducks and looks after them personally, very good sport can be had at little or no expense, because the sale of some of the ducks and eggs will pay the food bill, and, of course, there is no rent.¹

*The rentals paid for many upland preserves are from 5 to 10 cents per acre, or from \$32 to \$64 per square mile, per annum. Lands suitable for ducks which are only worth a few dollars per acre should be rented for less than the amounts named.

¹ Captain Oates says: "I am of the opinion that, provided a man feeds and looks after his ducks himself, is in possession of a supply of coops and runs, and is fortunate enough to have a suitable piece of water of his own, as well as a lot of ground to rear them on, that he can make his accounts balance at the end of the year. In other words, he will be able to give his friends some very enjoyable shooting, and supply himself with a hobby of which he will never be tired at no expense to himself." "Wild Ducks." By Captain W. Cope Oates. This valuable little

106 TO FORM A DUCK CLUB, OR SYNDICATE

The game farmers who rear large numbers of wild ducks and other game birds and sell the birds and eggs to game preservers find the industry profitable, but an individual shoot, where a sportsman pays all of the expenses, including the salaries of gamekeepers, is too costly for the average gun, and for this reason clubs, or syndicates, as they are called in England, are formed in order that the members may have good shooting and divide the expenses.

It is advantageous to have the cost of the shares and the annual dues small, so that desirable members of small means can be secured and practical game preserving can be made popular.

The cost of conducting a duck shoot varies according to the location, and it would be impossible to give an estimate of the expenses which would be found accurate everywhere.

The best gamekeepers in America receive about \$75 per month and their house rent, which may be estimated roughly at \$200 to \$300 per year. The cost of the food for the ducks depends much upon the place selected, since grain is cheaper in some localities than it is in others. The cost of the food can be much reduced when the grain is raised on the preserve.

A New York syndicate will propagate both wild ducks and upland game next season, and an accurate estimate of its receipts and a rough estimate of its expenses will be found in a note at the bottom of the following page.

book can be procured from The Amateur Sportsman Co., Box 22, Grand Central, New York. Price \$1.50.

In support of the above statement, Captain Oates prints some figures based on the rearing of 250 ducks. The food for the ducklings is estimated at £16, or about \$80.



GAMEKEEPER'S COTTAGE ON AN AMERICAN PRESERVE

"Field Sports tend to keep People in the Country"

TO FORM A DUCK CLUB, OR SYNDICATE 107

I believe a full allowance has been made for most of the expense items and that some of the stock birds can be purchased at a lower price than is stated. The club may, also, decide to purchase some eggs and to save in other ways.*

It is desirable to have at least 100 or 200 shares, in order that the dues may be small, but the number of guns that can be accommodated depends, of course, upon the size of the preserve. It is not a bad plan to fix the value of the shares at from \$25 to \$30 and to provide that members can own from one to twenty shares each, since those who can afford to contribute to practical game protection will take a number of shares, and the amount needed to pay the expenses of the shoot can be realized without

*

RECEIPTS FROM SALE OF SHARES.

200 Shares at \$30 each, \$6,000.

ESTIMATED EXPENSES OF PLANT AND ORGANIZATION.

Hatching House and Breeding and Rearing Yards, \$500; Extra Wire, \$200; Coops, Setting Boxes, Tins, \$250; Pheasant Pen, \$200; Expenses of Securing Leases and of Organization, 500; Stock: Wild Turkeys, \$150; Wild Ducks, \$450; Pheasants or Hungarian Partridges, \$300; Quail, \$225; Rabbits, \$45; 500 Hens, \$180. Total, \$3,000.

Surplus in hands of Directors, \$3,000.

RECEIPTS.

Annual Dues, \$6,000.

OPERATING EXPENSES (ESTIMATED.)

Shooting Rent, 10,000 acres at 8c. per acre, \$800; Wages of Gamekeeper, \$1,000; Rent Keeper's House, \$300; Extra Labor, \$1,200; Managing Director's Salary and Expenses, \$800; Food for Birds, \$1,500. Total, \$5,600.

This syndicate hopes to rear from five to ten thousand birds (including birds breeding wild and in captivity) the first year.

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having too many guns. The annual dues should be from \$25 to \$50 per annum.

The syndicate to which I have referred was started with one subscription for twenty shares, and several of the members own from two to five shares each. The others pay \$30 each for one share and \$30 annual dues.

If the shoot contains eight or ten thousand acres and is well watered a hundred members is not too many, since it is evident that some of the members will not shoot much or often, and there should be some "preferred stockholders," as a friend of mine humorously terms those who pay their dues and do not shoot at all.

It is not a difficult matter to secure preferred stockholders, since men easily can be found who are willing to aid in the restoration and protection of our indigenous game birds provided they can have some of them for their tables.

It is advisable to undertake the rearing of some upland game in addition to the wild ducks. Many sportsmen prefer to shoot over dogs.

Many species of upland birds will respond nicely to the control of vermin, and since the ducks nest early the gamekeeper can rear a lot of upland birds in captivity after his ducks are well started, and he can give some attention to the quail and other birds nesting wild on the preserve. He will see that they are not destroyed by their enemies or by farm machinery.

The first step in forming a game syndicate of any kind is to secure the signatures of the required number of members to a subscription contract. The simple form of contract used by the New York Game Breeders' Association is as follows:

TO FORM A DUCK CLUB, OR SYNDICATE 109

In order to form a game syndicate to rent the shooting and propagate game on lands in the vicinity of New York:

We, the undersigned, subscribe for the number of shares set opposite our names and agree to pay one-half of the amount when the board of management shall be chosen and the other half when called for by the board of directors.

It is understood that the shares are to be \$30.00 each and that the annual dues shall be \$30.00 per share. The dues shall be payable in 1911 as called for by the board of directors. The syndicate may be formed and the board elected when 100 shares are subscribed.

It is proposed to have 200 shares; not more than 20 to be held by any one person.

Name..... No. of Shares.....

A paragraph might well be added providing for the compensation of the person who secures the signatures and performs the work of organization, as follows:

"It is understood that A. B——, who has agreed to undertake the work of securing the signatures to this agreement, of organizing the syndicate and of procuring the shooting leases, shall receive for his services the sum of \$..... for each share and his necessary traveling expenses."

Much time necessarily is consumed in explaining the objects of the association to those who are invited to become active or "preferred" stockholders and in securing the leases from the land owners and in explaining the objects of the association to them, and it is fair that the person who undertakes this work should be paid. The work also will progress more rapidly if some one is thus employed than it will otherwise.

When the required number of shareholders have subscribed for the stock they should be notified to attend a meeting and elect a board of directors. Proxies should be secured from those who cannot attend the meeting.

110 TO FORM A DUCK CLUB, OR SYNDICATE

If the club decides to purchase any land it should be incorporated.

The board should be made up of from six to ten or more directors, and it should at once organize and elect its officers—a president, vice-president, secretary and treasurer. The board should select an executive committee of three members, and the chairman of this committee should be designated as the managing director. A simple constitution providing for the officers and their duties should be adopted by the members, and the board should have the power to make rules to govern the shooting and the conduct of the members. The simplest form of constitution used by social clubs will answer every purpose.

The managing director should recommend to the club the purchase of the stock birds and eggs and the appliances and foods and other things needed. He should visit the club grounds often and superintend the game-keeping and all work on the preserve, including the planting of grain. He should recommend the employment of additional labor and make reports to the board about the progress of the work. All expenditures of money should be advised by the executive committee before being acted upon by the board. The compensation of the managing director should be fixed by the board. The executive committee should receive their necessary expenses when visiting the preserve on business for the benefit of the association.

The shooting leases should provide that the exclusive right to shoot and fish on the lands and waters leased be granted to the club for a period of years. Five or ten years is the term often agreed upon. It is advisable that

the leases should contain a privilege of purchase at a fixed price. Often the land owners reserve the right to sell the land and to cancel the leases if a purchaser is secured. Where such provisions are incorporated in a lease the club should reserve the right to purchase at the price offered, and the owner should agree to first offer the land to the club.

The leases often contain covenants that the farmers will prevent trespassers from trespassing, or aid the club in so doing, and that prosecutions for trespass may be conducted in the name of the land owner or in the name of the club.

The leases often provide for the privilege of renewal at a fixed price. They should be recorded in States where the recording of leases for a term of years is required by law, and the lease should, of course, be drawn in conformance with the laws regulating conveyances, which vary in the different States. The form adopted should be approved by a local attorney, who should act as the legal advisor of the syndicate.

The publishers of *The Amateur Sportsman* have made arrangements to furnish information on all subjects relating to the organization of a game syndicate, including the forms for subscription contracts, the employment of gamekeepers, the selection of a site, the procuring of stock birds and eggs, and anyone interested in the subject will receive a prompt answer to a letter requesting information about any of these subjects.

In some localities the conditions are far more favorable for starting a game syndicate than they are in others, not only on account of the desirability of the ground, but also on account of the attitude of the residents towards those

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who undertake to breed game. These are many matters which should be carefully considered before a game club is organized.

The numerous game protective associations, which have been formed to procure game laws and to see that they are executed, might well favor game syndicates and undertake the practical increase of game in order to provide good shooting for their members. The gun clubs, also, which are formed to provide shooting at inanimate targets, easily might become game clubs and provide good field shooting for their members.

The "appetite for legislation"* in America nowhere is more enormous than it appears to be among those who are organized to restrict the taking of the wild food birds. As a result of this insatiate appetite North America has a thousand more game laws than any country which has game. Many ridiculous crimes have been created which do not rest on any legal principles, and the number of new laws and new crimes which annually are enacted and created is positively appalling.

It will be found quite as easy for the trap shooters to have good duck shooting as it is for them to have good shooting at clay targets. The members of the protective associations will find it easier to secure good bird shooting than it is to procure new game laws, and when the value of the meat secured is taken into consideration good sport appears to be within the means of anyone who is willing to do something practical.

The trouble in America heretofore has been that there has been no knowledge of the subject. The "more game"

*The Hon. Woodrow Wilson is reported to have coined this happy phrase.

clubs which are now being organized soon will be able to furnish accurate figures as to the cost of good shooting, and when the owners of game are permitted to sell some of the birds reared, during a long open season, I have no hesitation in saying that excellent duck shooting will cost little or nothing.

The reader has observed, no doubt, that no provision is made for the expenses of a club house. These may be made to suit the members of a syndicate if a farm house be rented or if a club house be erected. The sportsmen who go to shoot on unpreserved marshes usually board at a country hotel or gunning house, and the members of a syndicate easily can arrange to put up at a country hotel in the vicinity of their shooting ground, provided it be impractical to go and return the same day. I visited a preserve near New York recently and saw some fine duck shooting. A good bag was made. The sportsmen all left the city at noon and returned within an hour after dark. The chief advantage of looking after the game properly is that good shooting can be had in convenient locations where at present there is no game.

Every game club, or syndicate, should keep a game register, in which should be entered the names of the various species of game and the number taken by each gun. Some of the clubs have the names of the game printed across the top of the page, and the names of the sportsmen are entered at the left hand side of the page, and the number of each species of game taken is placed under the printed heading designating the species. The form of game register used at some of the American duck clubs is printed in "Our Feathered Game."

XV

THE RESTORATION OF WILD FOWL—LURING DUCKS AND GEESE

ANYONE who has traveled much must have observed that there are thousands of small ponds, lakes and streams in America where the wild ducks are seldom, if ever, seen. Many of these waters are attractive to fowl, since their natural foods are plentiful, and unattractive waters can be made attractive in the manner heretofore described. In the vicinity of the duck clubs often there are places where the ducks can be lured as described in this chapter, and sportsmen of small means easily can form syndicates, or clubs, and at a small expense per gun they can have good duck shooting during a long open season. It is necessary, of course, to employ a gamekeeper and to control the enemies of the ducks and to provide quiet nesting places where trespassers cannot enter to drive the ducks away.

The ducks from the club grounds as well as migratory ducks soon will visit such places, and the fowl easily may be lured from the neighboring marshes.

I wish to invite the reader's attention especially to the fact that no one will be damaged, provided the ducks be lured and restored to places where they no longer occur and that the laws should favor such industry.

Mr. De Visme Shaw in discussing this subject says: "We now come to the question of luring wild duck to frequent a certain piece of water as a feeding spot and to afford sport at flight time. When practiced near a part of the coast or any inland district frequented by duck, the system I am about briefly to describe invariably commands success.

"There must be a pond, either natural or artificial, to serve as the home of the decoy ducks. Though quite a small piece of water will answer the purpose in view, it is advisable that the pond be not less than a quarter of an acre in extent, while half an acre is better. A perfect pond can be made at small expense by cutting a pass athwart a marsh dyke. There should be some rough cover dotted around the water; the bank should shelve gently and should be of considerable area. It is here that corn is scattered, and it is one's object to ensure that the decoy birds and birds flying early shall be unable to clear up the food before the advent of late arrivals. Scattering grain thinly over a wide surface achieves this end.

"The decoy birds may be either a cross between the common game duck and the mallard or a further cross having the halfbred bird as one parent and the pure mallard as the other. I consider the former preferable when one's pond is within or near to a locality frequented by wild birds and the latter when it is more or less remote therefrom.

"The greater the proportion of domestic blood the stronger the attachment to home; the greater the proportion of wild blood the wider the range of the birds and the better the prospect of establishing leads from a dis-

tance. The ducklings should be placed on the pond at the age of eight or nine weeks. Never allow these decoy birds maize, as the food makes them too fat and hence disinclined to fly far on their own accord. If the pond be situated in a district where mallard breed, efforts should be made, by scattering wheat thinly over the feeding ground, to induce wild birds to frequent the pond as soon as the young are able to fly. When one has to rely on migrants alone early October is soon enough to abandon feeding after the ordinary manner in favor of scattering the corn over a wide area. The decoy ducks should be kept very tame."

Mr. Shaw describes the shooting of the birds which are drawn nightly to visit the pond as follows:

"A quarter of an hour or so before what you calculate to be the beginning of flight time, on the day arranged for the beginning of operations, give your decoy birds a full feed. Then let a dog put them roughly on the wing, a shot or two being fired as they are leaving the pond. They will not go far, and, having been disturbed in this manner, and having had their hunger quite satisfied, they will seldom return at the flight. The guns are then to take their places in the blinds. Repeat these proceedings every time of shooting. Not till the flight is quite over must there be made any attempt to gather the duck which fall. Mark them, by sound if not by sight, as carefully as possible, and let the dog retrieve them afterwards. As long as a lead remains unbroken sport may be had throughout the season. It should be made a rule never to shoot more often than once a week. * * * Ducks which have been shot at or have had their companions shot at a few times will often come in high over the pond

and drop to the water almost like stones. Such should be roused again directly they reach the water, when they are almost certain to give one of the guns an easy shot. So simple and so effective is the plan of obtaining tip-top flight shooting that one often wonders at the lack of enterprise on the part of owners of water naturally suited to its practice in so seldom putting it into effect."

The State game officers evidently cannot provide good duck shooting on the marshes which are now owned by individuals, and they have done nothing towards restoring the fowl to places which have been shot out. It would seem impossible for the State to introduce the ducks on ponds which are overrun by trespassers and by vermin wild and tame.

The State game officers might easily breed thousands of wild fowl on ponds owned by the State, and the ducks thus produced should be distributed as stock birds to those who will agree to look after them properly and to increase their numbers. The more capable game officers throughout the country now favor the profitable breeding of game by game farmers and preservers. They know that such industry should not be prevented by laws which shorten the season, limit the bag and prohibit the sale of desirable food.

In Massachusetts many wild fowl are lured to ponds by trained decoys which are taught to fly out over the water. The geese and duck decoys are bred near the ponds, but the breeding of ducks in large numbers for sport has been undertaken only on a few preserves in Massachusetts. The shooting of wild fowl over trained decoys seems to be a sport peculiar to Eastern Massachusetts alone. It is done for the most part in the ponds

of Norfolk, Plymouth and Barnstable Counties. Mr. Ware says: "Barring one stand near Portland and one on the shores of Quincy Bay by salt water, I know of no other places outside of this comparatively small district where wild fowl are taken in this way, but from Ponkapog, hardly a dozen miles from Boston, a skirmish line of shooting stands on the shores of the diifferent ponds stretches across the path of the Southerly migration of the birds as far east as Wellfleet far out on Cape Cod.

"The best opportunities usually come when the birds have been driven off their outside course by the heavy North Easterly storms of the Fall and early Winter, which send them inland, heavy winged and astray. . . . This is without doubt the spot they have sought, and, honking and quacking in grateful salutation, they set their tired wings and circle down. The sounds of welcome redouble in volume as they approach the surface of the pond, and in a moment, as if unable longer to await their coming, a flock of earlier arrivals in that haven of refuge swings out from the shadow of the woods like a committee of reception to greet them."*

Mr. Ware regards the geese as far more interesting than the ducks and says many of the birds develop marked individualities of their own in addition to the habits common to all of them.

"The goose 'callers' are either wild birds which have been captured and domesticated or birds more than a year old born in captivity from wild stock. The 'flyers' are born in captivity, of course, and the keeping up of the supply of goose 'flyers,' the most picturesque element in

*"In the Woods and on the Shore." By Richard H. Ware. L. C. Page & Co., Boston.

the whole sport to my mind, is the greatest difficulty connected with it. Apart from the raids of rats and skunks upon the young birds, the reasons for this are two—the apparent weakening of the ‘life force’ in Shavian terms in the birds born in captivity, so that mating is the exception rather than the rule among them, possibly because the field of natural selection is limited to the few rather than the many, and the fact that both goose and gander, once mated, are faithful in bereavement forever after.† This is doubtless highly creditable to the birds, though it has been suggested that this was the true reason of their being called geese, but it is equally inconvenient to their owners.”*

*“In the Woods and on the Shore.” By Richard H. Ware.

† See statement of Warren R. Leach, contra, in the chapter on Wild Geese.

XVI

WILD DUCK SHOOTING ON PRESERVES

THE reader no doubt wishes to know how wild ducks can be shot on small preserves without driving them away. When I first learned that they were preserving wild ducks in England I wondered how the fowl could be kept at home or within reasonable bounds after the shooting began, but some simple experiments which I made with mallards and dusky ducks, after I had studied the English methods as described in the magazines, soon satisfied me that the problem is as easy of solution as standing an egg on end is when one knows how.

The secret of success lies in keeping a pond or small stream absolutely safe and attractive at all times, so that when the ducks are disturbed and shot at when they fly about they will at once seek the safe refuge and remain there. They will do this, provided the food supply, natural or artificial, and the cover are satisfactory. Some birds, of course, may desert in company with strange ducks which visit the preserve, but the game consists in making the place so attractive that the visitors will be inclined to remain instead of taking the home birds away with them. A correspondent of *The Shooting Times* and

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British Sportsman says: "There are very few shoots, possessing water in the shape of a lake or pond, on which wild duck are not now reared, but we hear that trouble and disappointment are caused by the duck deserting. This cannot altogether be prevented with any birds allowed the free use of their wings, but if it occurs wholesale, there is something wrong as regards management. The general practice is to cram the duck with food all day and leave them without any at night, which is a complete reversion of their habits, as it is their custom to rest during the day and feed after dark. The really wild duck feeds to some extent during the day, but not like it does at night. If the duck are only supplied with a light meal during the day, and given a heavy feed just as darkness is setting in, nothing will tempt them to desert, for they are only liable to fly off at flight time.

"In a district close by the sea, or in other localities frequented by wild duck, those hand-reared must be watched closely, as it is the wild birds which decoy them away. The aim of readers should be to tempt the strangers to remain with the hand-reared duck, and this they are willing to do if privacy can be arranged. There is seldom any difficulty in inducing them to stay on a sequestered piece of water. The really wild duck appear among the hand-reared ones at night, flying down to them owing to their calling, and if our advice to scatter plenty of feed at dark has been followed, there should be attraction for the visitors to stay. Otherwise, the birds will soon leave for the feeding grounds and take with them some of the hand-reared duck. Even greater care must be observed at pairing time, for then the wild drakes do their utmost to decoy the females away, but if they

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can be induced to remain, there is little fear of inbreeding."

The shooting should be done before the ice forms, at which time or soon thereafter the ducks naturally are inclined to go South. Since the young of some species of ducks are fully grown and fly well by the last of August, the season should be made a long one.

I have shot many young ducks which were bred about the prairie ponds in several States when I was shooting prairie chickens in August and September, and those who undertake to save the wild fowl and to increase their numbers in the prairie States should save and multiply the grouse at the same time and have a variety of shooting.

The pond in Colorado (described in a former chapter) where the owner entertains hundreds of ducks near his house fairly represents one part of a good duck preserve, for which the owner acts as gamekeeper. The reader will remember that the ducks left this pond often to visit a lake and that some of them were shot as they passed overhead in going to the lake and when returning. Some, no doubt, were shot on the lake. Had those who did the shooting been permitted to disturb the fowl at will and to arrange their blinds so as to get the best shooting as the birds departed or returned, they would have had an excellent game preserve at very little trouble and expense. There would be no danger of driving the ducks away, provided the shooting be not done too often.

If the general public had been permitted to surround the little pond near the house and to bombard the ducks at all hours of the day the ducks would have deserted the place, and it would remain as desolate as the ponds are in New England and in other settled regions.

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On some of the small preserves where the ducks fly quickly out of bounds the shooting cannot be long continued or done oftener than once a week, since the ducks are disturbed by the firing near their safe refuge and soon become afraid to venture down to it.

We have, however, an abundance of room in America, and since the lands suitable for ducks are inexpensive many preserves can be started quickly and cheaply. When the ducks have several waters, a half mile or more apart, it will be an easy matter to have good flight shooting and at the same time to keep the birds within bounds. They will return to the safe pond when shot at, and, of course, they should not be too often driven out of it. There is more danger of the ducks becoming too tame where they are properly looked after than there is of their deserting.

The methods of preserving wild ducks and of shooting them on very small preserves may seem to be artificial. They are, more or less so, necessarily, but on large places the shooting need not differ much, if any, from the shooting at wild ducks in any good duck region. The shooting will be flight shooting at birds passing overhead, and the birds reared on the place, if they be properly handled and not overfed, will travel as fast and as high as the wildest ducks which come to join them at the times of the annual migration. Those who would criticise the shooting on preserves as artificial should remember that the duck shooting, which they enjoy, over decoys, is even more artificial, since the game is lured to the guns by the live or artificial decoys, and the shooting is far easier and, to my mind, far less interesting than the shooting at the swifter marks is.

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Where many ducks are encouraged to breed wild on the preserve the gunner can seldom tell if he is shooting at a hand-reared fowl or at one that has been bred in the marshes, provided always that the first named be not made too fat and lazy by overfeeding to fly well.

The reader should remember that it is an easy matter to domesticate certain species of wild ducks, especially the mallard and dusky ducks, the birds most used on preserves for hand-rearing, and that tame and overfed ducks are of little more value from a sporting viewpoint than ducks which have deserted the preserve never to return. It requires good judgment on the part of the gamekeeper to keep his ducks fairly wild and strong on the wing and at the same time to keep them within bounds.

On some of the small shoots in England the ducks are kept more tame than they should be on a larger area. The shooting sometimes is highly artificial. The ducks are handled in various ways so as to bring them to the guns continuously in small numbers.

The most artificial method of all, no doubt, consists in catching the ducks in the wire traps referred to elsewhere and in taking them to a distance from their pond and there releasing them singly and in pairs and small companies at short intervals. When the ducks are taken beyond a wood or strip of timber they must ascend to pass over it, and they will fly high in coming to the pond. In some places they are released from a hill or other elevation. I know a gamekeeper who can give a line of guns equally good shooting from a row of blinds placed about two gunshots or a little more apart. He has several ponds back of the shooting stands, and a good sized flock of ducks is reared on each pond. When the birds

are liberated they spread out in returning to their different ponds, and in this way ducks are made to pass over all of the guns in nearly equal numbers.

I much prefer the shooting of wilder birds on the duck pass and jumping them from before a boat, pushed through the wild rice; but each to his taste. The time for criticising the conduct of others as a means of increasing the game has passed. Almost everything that anyone could think of has been tried as a restrictive game law, and for good scientific reasons the laws have failed to stay the decrease of the game appreciably in settled regions.

The increase of game should be encouraged by every possible means, and we should always remember what one does in one way another may prefer to do in another and that everything making for the increase of game and sport is desirable and much needed.

We should always bear in mind the fact that the overflow of game from places where it is abundant is highly beneficial to those who do nothing towards aiding the good work of propagation. Many a stray duck will be shot outside of the game farms and preserves when these places are numerous, and this is the shooting I like best.

Near a duck preserve where many ducks are shot every season I learned that the gunners in the vicinity had some shooting at the ducks beyond the limits of the preserve which they certainly would not have had in the absence of the preserve, since no ducks ever were reared in a wild state in the locality and the place is out of the line of flight of the migratory fowl. There is no danger of our having too many preserves. They are more beneficial to free sport than game refuges.

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A few days ago I witnessed a shoot on a preserve not far from New York where wild ducks are artificially reared. There were six guns in the party and several of them undoubtedly were good shots, but they made many misses since the ducks were very wild and flew high and fast as they came to the guns over the tops of the trees, behind which they were stationed. I endeavored to keep an account of the number of shots fired in order to ascertain how many cartridges were used for each duck bagged. It was evident at the outset that from five to ten shots were being fired for each duck killed, but the shooting became very rapid at times and it was impossible to do more than to roughly estimate the proportion of shots and ducks. During the shooting about sixty-five mallards were bagged, and I am quite sure at least six hundred, and probably more, shots were fired.

Although I do not especially care for this kind of shooting, or, in fact, for any kind of shooting from ambush, since I much prefer to ramble about with dogs, and I care nothing for big bags, I must admit that the shooting at the mallards, which I observed, was as difficult as any shooting I had ever had or seen on a duck pass, and far more difficult than shooting over dogs is, excepting, possibly, the shooting in heavy cover.

Comparing the shooting at the hand-reared fowl with the shooting of wild bred ducks over decoys one is forced to admit that the last named seems like a child's play. It is by far the easier shooting.

The ducks were in fine condition and on previous days I was informed the bags were somewhat larger. Several hundred ducks were shot during the week and some of them were sent to market, very properly. Since every



A MARKET GUNNER
From a Painting by the Author

duck was observed, as it fell, and was quickly gathered, the element of cruelty, which some people who are opposed to field sports object to, was practically eliminated. The sportsmen spent an agreeable and exciting day in the open air; the cool breezes gave them the good color which indicates health, and since the game they killed is edible there should be no possible objection to the sport which induced them to spend the day in the country.

The guns and ammunition were the best that could be purchased, and some very long shots were made which killed the game instantly. Having passed the guns the ducks circled about and dropped into the pond beside which they were reared and I was surprised to observe how few of them left the preserve, which is not a large one. About a half dozen mallards were bagged by outsiders shooting at the border of the preserve, and they, too, fired ten and probably twenty shots for each duck secured. They were shooting heavy loads of No. 4 shot.

Although the birds were comparatively tame, when I observed them during the breeding season, as all game is when it is not disturbed, everyone who observed their swift and high flight admitted that the shooting was fully as difficult as the shooting at wild bred birds ever is, and far more difficult than it often is.

XVII

DISEASES OF WILD DUCKS

WILD ducks, autochthonic birds, are little subject to disease. They are more easily reared than pheasants.* The gamekeepers in America have been remarkably successful in rearing wild ducks in large numbers; often on very small artificial waters. Excepting one instance (when, unfortunately, the cause of the disease was not ascertained, but which was due probably to the feeding), I have never heard of any losses due to disease.

The young ducks should have shade as well as sunlight. Ducks hatched late in the spring or in the early summer do not thrive as well as those hatched earlier. This, no doubt, is on account of the hot weather which they encounter at an early stage of their existence when they are hatched late, and when the ducks are exposed to too much sun or heat they have a complaint which some duck rearers term "straddles." They go stumbling about as if they were dizzy and soon die. This is thought to be akin to what we call sunstroke, if not identical. I had a young, late hatched brood of mallards which were thus affected, and since I did not know the cause of the trouble I moved the hen and coop out to a sunny field where I thought

*"Wild Fowl." By L. H. De Visme Shaw. Fur Feather and Fin Series.

the insects might be more plentiful than they were in the barnyard, but the sun was very hot there, and one after another the young ducks began to stagger about, and within a few days they all died. I have no doubt that I could have saved these birds by rearing them in the shade.

The Rev. Adrian Woodruffe-Peacock, F. Z. S., in an article in *The Shooting Times and British Sportsman*, says:

"Wild ducks suffer from diseases like other birds. Enteric troubles follow on dirty or stale feeding, especially on overcrowded ground or waters. Ophthalmia is a constant source of loss, where foul heads are allowed from dirty feeding ways, or pans, or ground. Proper muddy water, with sand and grit, as suggested in this article, will practically rid ducks of this trouble. Lice, too, may trouble them, but mercurial ointment or insect powder will soon destroy these pests. Sunstroke, or 'splanders,' is very common with young ducks in bright summer weather, but shade and muddy water will keep them in health, or soon put them right, if they are provided beforehand, or at once upon the appearance of this trouble. A disease of the lungs and liver, new to science, which is very deadly, and common alike to grown ducks and fowls, I have met with, but as yet am not in a position to give advice about it."

The records from the English preserves indicate that the diseases referred to seldom make their appearance and sustain Mr. Shaw's statement that wild ducks are easily reared.

Last season (1910) many wild ducks died in Utah (where, I believe, no artificial rearing has been under-

taken), evidently from disease, and Mr. Chambers, the State Fish and Game Commissioner, sent some of them to the Bureau of Animal Industry of the U. S. Department of Agriculture in order to learn, if possible, the nature of the disease. The report, made by Mr. J. R. Mohler, Chief of the Division of Pathology, is interesting to sportsmen and scientists, but the cause of the disease does not seem to have been discovered. The report is as follows:

“WASHINGTON, D. C., Oct. 22, 1910.

“Regarding ducks received from you, Oct. 11, through the Bureau of Biological Survey, you are advised that death was due to intestinal coccidiosis. The postmortem examination showed the carcasses to be in good flesh. The viscera were apparently normal, except the intestines, which presented throughout the entire length more or less extensive areas of inflammation. Microscopic examination of the intestinal contents revealed immense numbers of coccidia in various stages of development. Microscopic examination of the heart blood of these ducks was negative in three cases. In one case the blood showed in stained films paired rods with rounded ends, somewhat larger than *B. coli*, also filament and chain formation. The inoculation of a pure culture of this organism into a chicken was negative. The feeding of intestinal contents to half-grown chickens gave negative results. Similar material inoculated into the back of a rabbit developed a small area of coagulation necrosis. The death of the rabbit five days after inoculation was due to a severe intestinal and hepatic invasion of coccidia, but a condition quite prevalent in rabbits and due to a coccidium peculiar to that species of animal.

"It may be interesting to you to have the results of two earlier investigations into the cause of death of the Salt Lake City ducks. Two, received about Sept. 20, in such a stage of decomposition that bacteriologic examination was not feasible, gave marked evidences of inflammation of the intestines and revealed in the intestinal contents upon microscopic examination a large number coccidial forms. In the case of two ducks received Oct. 5 from Dr. F. E. Murray, inspector in charge at Salt Lake City, the tissues had been so acted upon by the alcohol in which they were shipped that all bacteriologic showings were negative. These two birds were quite different from the others, being extremely emaciated, and the alimentary tract being absolutely devoid of contents from mouth to vent. No coccidial forms were recognized in one of the ducks, whereas in the other, which showed a marked enteritis, were found what were diagnosed as schizont forms of the coccidium."

A writer for Pearson's Weekly says: "Wild ducklings are much easier to rear than pheasants, being free from the majority of pheasant ailments. In fact, when they are a week or so old, they are able to do without the warmth of their fostermothers. They must, however, be protected from keen winds and hot sun. Without shade, the little ducks are liable to die wholesale from sunstroke. Some people call sunstroke 'straddles,' regarding it as a mysterious disease of unknown origin, and assume that to rear ducklings after May is to invite disaster. Provided with compulsory shade, ducklings will thrive all through the summer. . . . A bag of one thousand ducks is not rare nowadays. For three days in succession an average bag of over fifteen hundred has been obtained

each bird taxing severely the skill of the shooters. Such vast bags explain the absurdly low price for which a couple of the finest birds may be bought by anyone who cares for a change from beef and mutton.”*

I have seen thousands of young wild ducks herded closely on small rearing grounds and waters. The birds were in excellent condition throughout the summer, and all were strong on the wing in October and flew high enough and fast enough to test the skill of the best shots. It has been suggested that the fact that they may be kept without harm in close quarters is due to their spending much time on the water. The soil is not fouled to the extent it would be by land birds.

*Ducks have been quoted in English market reports as low as 2 shillings per brace. Captain Oates says that ducks in fine condition should sell for 2 shillings each if sold at the right time. “Wild Ducks,” p. 57. In an English market report for 1907 the game birds are quoted as follows: Pheasants, 4s 6d to 5s brace; partridge (young), 3s brace; partridge (old), 1s 6d brace; hares (English), 2s to 2s 6d each; leverets, 1s 6d to 1s 8d each; wild duck, 1s 3d to 1s 6d each; pin-tail, 1s to 1s 2d each; widgeon, 10d to 1s each; teal, 8d to 10d each; woodcock, 1s 6d to 1s 9d each; snipe, 6d to 9d each. Supplies fair, but meeting a moderate demand.

XVIII

WILD GEESE

THE Canada wild goose, the common wild goose in America, formerly was tremendously abundant and visited the bays and marshes of both coasts in large flocks on its Northern and Southern migrations. The birds were equally plentiful in the interior, and nowhere have I seen them in larger numbers than in the Mississippi and Missouri valleys. The persistent shooting at these big game birds during a long open season and the destruction of their breeding grounds have caused a marked diminution in their numbers. In many places they are no longer seen.

Since the wild geese are very wary birds and well able to take care of themselves I am inclined to believe the destruction of their breeding grounds is a more important cause for their disappearance than the shooting is.

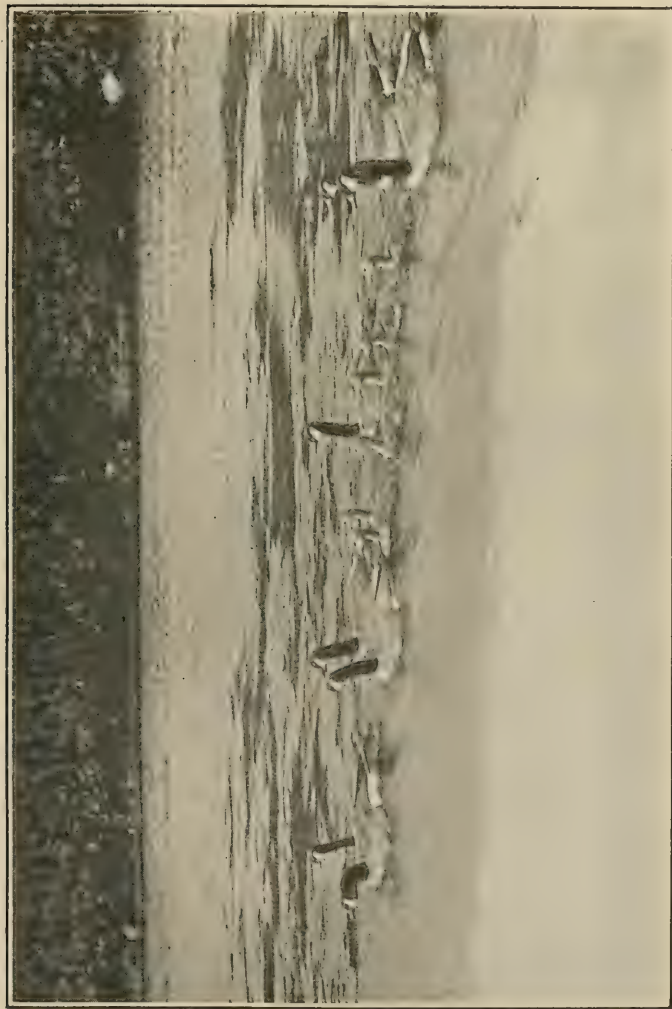
The wild goose has been domesticated easily, and I have seen it breeding in many States from New England and North Dakota as far south as North Carolina. The birds reared in captivity are used, for the most part, for decoys; in some places they are bred as ornaments for ponds and lakes. A number of the game farmers can supply breeding fowls and eggs. Mr. Whealton has

many wild geese on his wild fowl farm, at Chincoteague Island, Virginia, and many of the clubs and many gunners and baymen from Massachusetts south to Florida can supply a few birds for propagation. I have seen the geese breeding in Connecticut, quite near New York, and Mr. Ernest Thompson Seton has a number of geese on his lake at Cos Cob, Conn. His birds fly about the neighborhood, but are quite tame and nest in safety. They are properly looked after and fed. There are many geese on Long Island, N. Y., which are quite tame. One of the best flocks I ever saw is owned by Mr. Remsen, who has a country place near Speonk, Long Island.

While the geese for the most part are used as decoys, it seems likely they can be made a very good sporting bird, especially in places where gamekeepers are employed. When game preserves become numerous they will fly from one preserve to another, and I have no doubt the shooting will be much improved on public waters and that the markets will be full of wild geese at reasonable prices.

Geese often do not mate or nest in captivity, and in ordering them from game farmers the purchaser should stipulate for mated birds. These command much better prices than birds which are not mated. In Mr. Whealton's price list, for 1910, Canada geese, young pairs one to three years old, are quoted at \$6.50 per pair; mated pairs, five years old, \$10.00; breeders, ten to twenty years old, \$15.00 per pair.

The Canada goose lays from six to nine eggs, sometimes more when the bird is domesticated, and they are a uniform ivory white. During July the young are hatched and the old birds moult. This is a dangerous



WILD GEESE IN CENTRAL PARK, NEW YORK
(Note the formation to guard the Goslings)

period for them, as their means of escape is limited to hiding away in the marshes, at which they are very skillful, or else keeping out in the center of lakes or other large bodies of water. Many, however, are killed at this period, and sometimes whole flocks are captured alive, of which fact Hearne relates an instance when some Indians drove into Fort Prince of Wales, on the Churchill River, forty-one old and young birds which were incapable of flying, and which were herded as easily as if they had been domesticated.* A game keeper undoubtedly can rapidly increase the numbers of the geese since he protects them from their natural enemies.

Where only a few geese of one family, or closely related birds are held in captivity, it may be the geese do not breed because they are too closely related and that if the birds be given a wider field for selection they will do better. I hope to make some experiments next season with geese procured in Dakota and in New England and Virginia and the reader who undertakes game preserving, no doubt, can make similar experiments to advantage, not only with geese, but with several species of ducks.

The Canada geese are long-lived birds. Mr. Whealton, the largest breeder of wild geese in the United States, says, in his circular that he has been breeding over fifty years and some of his oldest breeders are well past the half century mark. In breeding he has eliminated the unfit, keeping only the best of his own for that purpose, as well as adding each season the largest wild ganders or "leaders" of the Canadas taken on the coast. He now has over 500 geese "scattered around the island (Chin-

*Wild Fowl of North America. D. G. Elliot. P. 58.

coteague), all pinioned when goslings or when captured, but otherwise, at full liberty, for those which come from such a long line of domesticated ancestry, once accustomed to a place, will not run away.

"Canadas begin breeding at three or four years of age, but their value as breeders increases definitely with age, for young pairs are so erratic in this respect that I can guarantee only my ten to fifteen year olds mated breeding pairs, and these only I exchange if they do not breed after the first year in their new surroundings. This will explain the seeming disparity in prices of young and old pairs; young pairs are suitable for decoys, etc., but breeders who wish to get quick results know the value of these old pairs. Canada geese are easily bred, if these few essential requirements are observed:

"(1) The mated pairs should be in their breeding quarters as early as possible before the laying season (March) begins.

(2) Small knolls should be thrown up in the pond, two feet above the water, or at the edge of the pond, and some bushes stuck circularly around the tops which should be flat and large enough for the nests.

"(3) The enclosure should contain a fresh water pond of sufficient depth to permit their sexual intercourse while swimming—usually they will not breed otherwise.

"(4) Immunity from disturbance by dogs, visitors, children, etc., during the entire breeding period is very important.

"(5) Food: Corn alone is sufficient for the adult geese; coarse yellow cornmeal for the wild goslings."*

*The reader should remember that Mr. Whealton's birds have considerable liberty and undoubtedly procure much natural food.

Mr. Whealton says the above applies as well to the breeding of black and white swan, with the exception that they may be purchased at any time except in the coldest weather; the white swan breed in the late spring and the black Australians irregularly throughout the year.*

Mr. Warren R. Leach, whose experience in the breeding of wild water fowl (especially the Canada or common wild goose) extends over a period of more than thirty years, wrote for me the following account of breeding wild geese in captivity, which I printed in *The Amateur Sportsman* (June, 1910):

"It was some time in the seventies that my brother called my attention to an advertisement of a party in Fort Dodge, Ia., in one of the sporting magazines who offered Canada wild geese for sale. Geese were then nesting plentifully in parts of that State, and those offered for sale were goslings captured from the adjacent sloughs. I mention the pair which we purchased because of the frequent statements made that wild geese mate for life. Undoubtedly this is ordinarily true, but there are exceptions. This pair never nested, and we finally bought another male and two females. The Iowa gander promptly selected one of the new females for a wife, and they raised young for years, while he drove his former mate out of his sight at all times. She never mated again and was evidently a barren goose, and the gander undoubtedly was aware of it.

"In 1892 I obtained a large wild gander shot from a

*Mr. J. W. Whealton's "List, Description and Prices." This will be sent to anyone on application to Whealton's Wild Water Fowl Farm, Chincoteague Island, Va.

passing flock. Several years afterward he mated with a goose which laid and began sitting. He then went across the ravine and escorted another goose to a promising site, where she made a nest and also laid eggs.

"About this time I obtained a goose from my neighbor, Mr. George E. Walker, and turned her out in the lots. Imagine my surprise when the old Mormon took his third wife, and they raised young ones the same season. This mate he kept for years, and she was evidently his favorite.

"The present season I purchased a fine eight-year-old pair of mated Canadas from a party on the Atlantic coast which were until two weeks ago contentedly planning to raise their young. They sat by the hour on a hummock and arranged the nest, then all at once there was a disagreement in the family. The old fellow has driven his wife from his bed and board and will not allow her near him. She sits disconsolate by herself or wanders away to the vicinity of the pen in which are the unmated ganders, which run squawking to the fence to meet her. Except in the three instances above cited I never knew the mated pairs to be unfaithful among the full bloods, although at the present time I have one old Canada gander who has two wives—both tame geese—which have separate nests, and the old fellow puts in all his time guarding first one, then the other.

"In the nesting season it is imperative that the geese have water deep enough for them to swim, otherwise the eggs will not be fertile. In small enclosures it is also necessary to have a light but close fence between each breeding pair since the ganders are exceedingly pugnacious, fighting all others near them and sometimes drag-

ging the females off their nests and driving them away. It is rarely that they begin laying until three years old, although I have known of one or two in recent years which nested when two years old and raised young. The first year wild geese lay four or five eggs, generally five, and as they get older they will sometimes gradually increase the number laid to six or eight eggs.

"The period of incubation is from twenty-eight to thirty days, depending somewhat on the weather. When hatched the old goose keeps the goslings in the nest until the morning of the second day, when she leads them out and carefully guides them to where they can pick the fresh grass or weeds. No feed is required for the goslings at any time if there is a pasture or grass lawn over which they can roam. While I feed them grain it is merely to make the geese gentle and to teach them to stay about closer.

"All my young geese are pinioned when small. If this is done before the wing feathers begin to grow there is scarcely any bleeding from the operation. There are three periods each year in which the domesticated wild geese are disposed to wander away. Each spring and fall as the flocks pass over in their migrations my birds answer to the call of the wild. Gathering at one side of the enclosure, they stretch their necks to the utmost. Slowly they give out their guttural notes, which gradually are sounded faster and faster until finally, with discordant cries and a beating of the air with their wings, they sweep to the farther side of the pasture. Not deterred by the failure to rise, they walk back and the performance is repeated again and again.

"There is another period when they seem impelled to

travel and this is in July, provided there are any broods of goslings. Otherwise they do not seem to desire to go. Many times have I watched them walk round and round hunting for a loophole, and tight indeed must be the fence if they do not find one.

"At this season their direction of travel is north-easterly, and I never found them going in any other. Why they take this direction at this time has never been clear to me.

"Wild geese are exceedingly afraid of dogs and will not do well where disturbed by them. I once had one sitting on seven eggs when a small dog came into the yard and began playing, running in circles, each one larger than the one before. Finally, in one grand rush, the goose was just in line, and the dog, which had not seen her until the last moment, jumped clear over her. The dog was so scared he ran home, while the goose flapped screaming from her nest and began running at top speed. She continued running and squalling for almost a day and a half until she fell exhausted and died in a few minutes. This goose was raised in captivity and used to dogs all the nineteen years of her life, yet the sudden fright was more than she could stand.

"In recent years I have found that one can get a second clutch of eggs if the goose is shut out from the first nest for a few days just when she begins to feather it. It is thus possible to double the number of young raised each year, which is indeed quite an item where space and the number of birds kept does not permit of the slower way of increasing the flock.

"Notwithstanding the fact that few geese are brought to bag by the gunners of the present day, they are stead-

ily decreasing in numbers, although they are a long-lived bird. My Canadas range in age from three years up to an old mated pair that are twenty-four or twenty-five years old.

"Mr. J. W. Whealton of Chincoteague Island, Virginia, whom I consider the greatest breeder of Canada geese at the present time, has made a complete success of it, and some of his old mated pairs have been breeding for more than fifty years. It is a matter of record that one old gander in one of the New England States was eighty years old when the owner killed it because it had become 'mischievous.'

"In 1907 the writer spent the entire summer in Alaska, and the geese were breeding by the thousands in the swamps near the mouth of the Copper River. The young were ruthlessly slaughtered by the Siwashese, eaten by the vermin, which abounds there, and otherwise destroyed in large numbers before they could fly. Some day in the very near future we will see the great V shaped flocks no more.

"Who has not felt a thrill as he read the lines of Bryant in his 'Ode to the Waterfowl?' 'All day at that far height thy wings have fanned the cold, thin atmosphere,' yet how few of the younger generation east of the Mississippi River have seen them of recent years passing over, high in air. But we are fortunate in that these noble game birds will increase in captivity and still retain their health and all their wild characteristics year after year. There is no reason why under the wise provisions of the proposed 'breeders' law' they should not be found all over our country, both for ornamental use, for sport and for the market. Such legislation certainly will not decrease

our game, but will greatly increase it. Let every one join the ranks of those who are striving to save game birds from the fate of the buffalo and the passenger pigeon."

The Canada goose breeds in the North, and the principal breeding ground seems to be the region referred to as the "ducks' paradise."

Mr. Cooke, who is an authority on the migration of birds, says the principal summer home of the Canada goose is the interior of Canada, from Saskatchewan and Alberta north to the limit of trees. Eastwardly it breeds commonly in the interior of Ungava and rarely on the coast as far north as Okak and Ungava Bay. It is not a rare breeder in Newfoundland, and is fairly common on the islands of the Gulf of St. Lawrence and thence west through Quebec and Northern Ontario to the southern end of James Bay. Any occurrences south of this district must be considered accidental or casual, though it has been recorded as nesting at Lexington, Mass., April, 1888, and once at Hartland, Vt.

In the interior of North America the breeding range extends somewhat farther south. A hundred years ago the species bred commonly in all the northern third of the Mississippi Valley and not uncommonly to the latitude of St. Louis. Now the number of pairs breeding south of the latitude of central Iowa is very small, though even of late years the Canada goose has been known to breed at Samburg and at Reelfoot Lake, Tennessee, which seem to be the most southern localities known east of the Rocky Mountains. A few breed in Kentucky, and the number increases slightly in Indiana and Illinois and the southern third of Michigan and Wisconsin. North of this

and throughout much of Minnesota the species is a regular and not uncommon summer resident. The Canada goose formerly bred in Kansas; now it breeds rarely in Nebraska and southern South Dakota; regularly in North Dakota and northward. This species still breeds in the northern third of Colorado, in northern Utah, northern Nevada, southern Oregon and northward. A half century ago it was recorded as breeding as far south as southern New Mexico. The Western boundary of the breeding range extends from the interior of British Columbia to the upper Yukon and to Fort Yukon, with a few stragglers west to the Yukon mouth. The reader will find interesting tables showing the dates of the arrival of the Canada goose at various points along the Atlantic coast and in the Mississippi Valley during its spring and fall migrations, in a bulletin issued by the U. S. Biological Survey.*

The Hutchins goose is similar to the Canada goose in pattern, color and markings, but somewhat smaller. This species is the most northern of the several forms of Canada goose and nests from Melville Peninsula north to latitude 70° and west along the shores and islands of the Arctic coast to the mouth of the Mackenzie and through the interior of Alaska to the Kowak River. Apparently it does not breed in the interior of North America south of the Barren Grounds, but on the Pacific coast it breeds in the valley of the Kowak River and south to the mouth of the Knik River; also abundantly in the western Aleutian and on the Near Islands.†

*"Distribution and Migration of North Am. Ducks, Geese and Swans."
By Wells W. Cooke. Bulletin 26, Biological Survey, U. S. Dept. Agr.

6 Ib.

Other American wild geese are the Cackling goose, a bird very similar to the Canada goose, only smaller; the Emperor goose; the three Snow geese, which are white as the name indicates; the Blue goose; the American White-fronted goose and the two Brant. All of these birds breed in the North beyond the limits of the United States, and comparatively little is known about the breeding habits of some of them.

Mr. Whealton says the Brant goose thrives in captivity and he has never lost one by disease. Laying only in the farthest North, no degree of cold found in our latitudes affects them, while they endure our summers like tropical fowl.

The reader will find all of the geese pictured and described in my book, "Our Feathered Game." Their distribution and migration is exhaustively discussed by Mr. Wells W. Cooke in his bulletin, to which I have referred.*

The geese, excepting the Canada goose, have not been bred in preserves.

* "Our Feathered Game." New York. Charles Scribner's Sons. Bulletin 26, Biological Survey, U. S. Dept. Agr. See also Eliot's "Wild Fowl of North America."

XIX

THE SHOREBIRDS OR WADERS

ALTHOUGH the shorebirds cannot be artificially reared on game farms and preserves as the upland game birds and some of the wild ducks are, much can be done to increase their numbers when breeding wild. Safe nesting places can be provided for the woodcock, snipe, plover, sandpipers and the other species of waders which nest in the United States and Canada, and it is evident that the birds will become more abundant in places where their natural enemies are controlled and where dogs, cats, rats and trespassers are excluded than they are in places where they receive no protection of any kind excepting that afforded by game laws which are not executed. I have observed many species of shorebirds breeding abundantly on preserves where the wild ducks are looked after properly, and they evidently respond nicely to the protection extended to the ducks.

The enemies, furry and feathered, which destroy other game destroy also the shorebirds, or waders, and the common house cat alone is sufficient to prevent an increase of the woodcock in many places. When a gamekeeper persistently controls the enemies of the wild ducks or of the true game birds on the upland he neces-

sarily saves many woodcock in wooded regions where they occur, and even in many small swamps where there are alders, willows or other trees. The snipe and some of the plover formerly nested in many marshes which are suitable for ducks.

At some of the duck clubs where wooded lands adjoin the marshes I found many woodcock, and on the open marshes I saw many snipe, all of which had been bred within the preserves. The exclusion of trespassers alone is of great benefit during the nesting season, and at the duck clubs the snipe often become numerous and very tame. Many of the gunners prefer to shoot the larger ducks and the snipe often are not shot at all.

At one club I saw large numbers of snipe and several species of plover, yellow-legs and other waders, and I have never seen game birds so tame as these birds were, even on the frontier in the days when the gunners shot big game only.

Those who are inclined to oppose the preserves for selfish reasons do not realize that large numbers of migratory wading birds as well as fowl are reared on preserves and that they must furnish good shooting for some one when they migrate Southward in the autumn. Were it not for the preserves and posted farms our game would have vanished far more rapidly than it has, and those who have studied the situation know well that all game must be properly looked after and given a chance to multiply or it will vanish from the earth, provided field sports be not absolutely prohibited. Even the prohibition of sport cannot save some of the most desirable species. There will be, always, some illegal shooting, and the cats alone, in farming regions, upset nature's balance.



WOODCOCK

Life Portrait by Dr. R. W. Shufeldt

In England, plover eggs are gathered yearly in large numbers and sold in the markets without apparently causing a diminution in the number of these birds. In America the naturalists and sportsmen agree that the upland plover, and some of the other waders, are nearing extinction.

Preserves for upland game and for wild ducks undoubtedly will save these birds just as the English preserves have saved the English woodcock and other waders. Since it is evident that it cannot be long before there will be no shorebird shooting for anyone, all prejudice against the individual handling and preservation of game should vanish. There is no danger of our having too many preserves; the country is too big. The danger is that we will not have enough of them in time to save the vanishing game.

The woodcock is one of our most valuable wild food birds, and it is especially interesting to sportsmen. Although it is an easy matter to restore the grouse, quail and many of the most desirable species of wild fowl and to make them more plentiful than they ever were on suitable ground, it is impossible to purchase woodcock and turn them down in the covers where they have been extirpated or even to feed them as upland game is fed on game farms and preserves. Many naturalists and sportsmen seem to believe that nothing can be done to save this interesting bird excepting to enact additional laws restricting the sport of cock shooting and prohibiting the sale of the birds as food. Some entertain the opinion that the woodcock is doomed to extinction.

In the year book of the United States Department of Agriculture for 1901, Dr. A. K. Fisher, the ornithologist

of the Biological Survey, discussed "two vanishing game birds—the woodcock and the wood-duck," and his article was issued by the department as a reprint, or bulletin, and widely distributed. Unless strong protective measures are soon adopted, we are told, the woodcock and the wood-duck, two popular and valuable game birds, will become extinct. "In many places," Dr. Fisher says, "where twenty-five years ago a fair shot with a good dog could secure forty or fifty birds in a day's hunt, it is doubtful if ten per cent. of the former bag could be obtained."

There are thousands of suitable covers from Maine to the Mississippi Valley and as far West as Eastern Kansas and Nebraska where not a single bird can be found today at any season of the year, and the places where the small percentage of birds named can be obtained are comparatively rare.

I have seen the woodcock as plentiful as Frank Forester says they were. The younger sportsmen cannot imagine how abundant they were a few years ago in the Mississippi Valley and, in Forester's time, in the immediate vicinity of New York City. Writing of the shooting in Orange County, N. Y., he says "the numbers I have seen are incredible." In 1839, shooting with Mr. Ward, of Warwick, who weighed above three hundred pounds and shot with a single barrelled gun, they bagged in three successive days, fifty-seven, seventy-nine and ninety-eight cock over a single brace of dogs, not beginning to shoot until it was late in the morning. The following year, shooting with a friend from New York (with muzzle loading guns, of course), the bag contained one hundred and twenty-five birds the first day and seventy

birds the second morning, before noon, when the powder and caps gave out.

Although it is a bird of moderate fecundity (the eggs are seldom more than four), I believe it is possible to make the woodcock as abundant as they ever were and that this will be done in some localities within a very few years. The prohibition of summer shooting undoubtedly has produced good results, since it has checked the rapid disappearance of the cock, but the shooting of an ever increasing army of guns undoubtedly will prevent any rapid increase of the game if it does not cause a steady reduction in its numbers, and in places where the wet woods are drained the birds, of course, must vanish. It is well known, as I have observed, that where any species of game becomes scarce its natural enemies become comparatively superabundant, and the result of such conditions are disastrous even in the absence of any shooting. As the country becomes settled the domestic enemies of the woodcock—dogs, cats and rats—are added checks to its increase, and nature's balance is upset in the wrong direction. Dr. Fisher, in the bulletin cited, says it is probable that the cat, red squirrel, sharp shinned hawk and mink are among the most important natural enemies of the woodcock. To this list should be added some of the other hawks, the crow, weasel, skunk, raccoon, jay, snakes and owls. Dogs also, running at large, sadly interfere with the nesting woodcock and destroy many young birds, and rats are regarded by all gamekeepers as among the worst pests.

I am told, repeatedly, that the natural enemies of woodcock and other game were abundant when the game was most plentiful. This is quite true, but it does not

disprove the fact that when the guns and the cats and other domestic vermin are added to the ordinary checks to increase, the game must diminish in numbers rapidly. Mr. H. P. Clement, of Vermont, told me recently that he saw a cat bring a woodcock up to the porch. My cat brought in robins and a flicker, or golden woodpecker, last summer and was very active until it lost its life on account of the flicker. Cats have an open season throughout the year, and the destruction of birds by these animals is appalling. Their depredations can be stopped, however, and they will be when it pays to do so. The wilder enemies of the woodcock can be controlled, partly at least (they never have been fully checked, even in England), and the result of such control instantly will be evident.

Not long ago I went to visit a game preserve a few miles from New York City, where the wild ducks are tremendously abundant, thousands of these birds having been artificially reared by a Scotch gamekeeper last spring. As a result of the protection given to the ducks the woodcock have returned in good numbers, and they nested in perfect security last season in the little swamps all over the preserve. The gamekeeper, in order to show that a setter which he had been breaking was well trained, took him into a little alder brake not far from the house, and he pointed one woodcock after another in fine style. A dozen or more birds were flushed on a very small area. One of the birds was shot to prove that the dog would retrieve it, which he did handsomely. I am quite sure there would not be a woodcock on the place were it not for the practical protection afforded. The region is thickly settled, and in the absence of a gamekeeper the

ground would be overrun with stray dogs and cats, to say nothing about trespassers. The place would be untenable for nesting birds, and if any stopped to feed in the autumn they would be shot to the point of extinction. At the present rate of increase the birds on the preserve soon should be as abundant as they were a little to the northward, where Forester made the big bags I have mentioned. Sportsmen should remember that in all probability there would be no woodcock on the ground for anyone in the absence of practical protection (for this reason no one is damaged), and a good number of the birds reared will migrate and afford sport on free territory. As the Game Commissioner of Colorado well said, writing about the benefits of the preserve system which is encouraged by sensible laws in Colorado, many guns shoot on the preserve which otherwise would shoot on the public range, and this is beneficial to the public game. The markets also are filled with game without loss to the game which is not properly looked after.

On some of the Western duck preserves I found the woodcock, snipe and other waders breeding abundantly because of the protection given to other game. A woodcock, flying across the track, was killed by a train in front of the club house of the Redden Quail Club, in Delaware, while I was sitting on the porch. At the duck clubs I noted that the woodcock, snipe, yellow-legs and other waders seldom were shot, since the owners of the preserves are duck shooters.

On a nut plantation in Connecticut both quail and woodcock breed every year because trespassers are kept out, and the vermin is partially controlled by the nut grower, who formerly was an ardent sportsman.

The woodcock are not found in the depths of large forests, and the reduction of vast forested areas to small wooded tracts, many of which contain swampy places where the food of the woodcock abounds, increases the area suitable for cock shooting.

The earth worm is the staple food of both the snipe and the woodcock, and although, as I have said, it is not practical to feed the woodcock, I can furnish a useful hint for those who may undertake their practical salvation—the natural food of the woodcock can be increased.

Often I have observed that the Wilson's snipe were plentiful in pastures and on wet prairies where cattle were feeding. I was inclined to believe that the tramping of the cattle made the ground especially suitable for the boring of the snipe in their search for food. I now believe the manuring of the ground causes an increase in the number of earth worms, and this fact seems to have been proven by a California duck club which transformed a salt marsh, where there were no snipe, into a good shooting place by damming out the salt water and manuring the ground. The food for woodcock in small brakes might be increased in the same manner. If the wet woods be enclosed with a wire netting and some pools be made it would be an easy matter to introduce the other "vanishing bird" mentioned in Dr. Fisher's bulletin—the beautiful wood-duck—and to make it abundant in the same ground with the woodcock. The place should be kept absolutely quiet during the nesting season, and all vermin should be controlled. Arrangements have been made for some very interesting experiments with these birds next season on some good cock grounds very near New York City.

All of the shorebirds, or waders, are pictured and described in "Our Feathered Game," and the reader will there find a brief mention of their habitat. Like other game birds, the shorebirds which formerly nested in any locality are the easiest ones to restore and make abundant. Many birds which never are seen at present will return to safe nesting grounds when they learn that they will be properly looked after and protected. If they appear in small numbers they should be encouraged to remain and nest.

The distribution and migration of the North American shorebirds is exhaustively discussed by Mr. Wells W. Cooke in Bulletin 35, Biological Survey, U. S. Department of Agriculture.

The Wilson's snipe, one of the most valuable shorebirds for sporting and economic purposes, has been driven away, like the ducks, from many localities, by the draining of the marshes. When it becomes known that the snipe and ducks, which can be reared on many wet lands, are worth more than any crop which can be produced on the same ground, I believe some of the snipe lands will be preserved for sport and for profit. The snipe breeds in many of the Northern States, and the number of breeding birds can be increased, undoubtedly, in places where the snipe now nests. The breeding range of the snipe and some other species possibly can be extended Southward by the practical protection which is extended by gamekeepers.

The upland plover, or Bartram's sandpiper, is one of the best shorebirds for the table, and it is pursued eagerly by sportsmen. It inhabits the plains, prairies and fields and is seldom found near water. I have seen these birds

very abundant on the Western prairies, but, like the prairie grouse, they have vanished absolutely from vast regions and are never seen in many counties where they once were most plentiful. Mr. Cooke says early in the settlement of the Mississippi Valley much more than half the upland plovers probably nested within the boundaries of the United States. The center of abundance during the breeding season was the prairie region from Kansas to Manitoba. The numbers were not greatly diminished so long as this region was used for stock purposes, but recently the birds have rapidly decreased.

When it pays to preserve the prairie grouse the upland plover will be protected undoubtedly, and many of these splendid food birds can be shot by those who go afield for the grouse. The upland plover once were abundant in New England and on Long Island, N. Y. They will return in increasing numbers when some of their nesting grounds are preserved.

The three most valuable waders for sport are undoubtedly the woodcock, Wilson's snipe and the upland plover, and it is fortunate that these birds can be saved and made abundant within the limits of the United States. The larger plovers, sandpipers and curlews for the most part breed north of the United States, but these birds and many of the smaller species, which are not interesting to sportsmen, will be much benefitted when game preserves within our borders become numerous. They will find safe refuges from persecution upon their Southern migration, since they will not be shot in large numbers in places where the grouse, ducks, quail and other more desirable game birds are plentiful. Some years ago when I used to shoot ducks in North Dakota the yellow-legs,

golden plover and many other shorebirds were very abundant. I shot several dozen of these birds one afternoon beside a small lake, but when I returned to the army post, where I was stopping, I found it impossible to give them away. Larger game birds, including prairie grouse and wild ducks, were very plentiful, and no one could be found willing to pluck and cook the waders. For this reason I ceased shooting them.

The same condition existed in the Eastern States when the heath hens, wild turkeys and canvas backs brought only a few cents in the markets. When we make the most desirable game birds abundant and cheap the shorebirds will be comparatively safe from harm in many places, and they will be in no danger of extirpation.

XX

REMEDIAL

BEFORE discussing the amendments to the game laws which, in my opinion, are absolutely necessary to make the wild food birds abundant and cheap in the markets, I wish to say that I am not opposed to many of the restrictive game laws now on the books. Laws which shorten the season, limit the bag and prohibit the sale of game tend to delay its extirpation, undoubtedly, and they are necessary in places where no one looks after the game properly. As the game vanishes it will be necessary, from time to time, to increase the restrictions of field sports and to prohibit shooting for periods of years. The laws, however, can be amended so as to permit and encourage the profitable breeding of game without in any way interfering with the present laws restricting sport, and the result of such legislation will be beneficial not only to game breeders but to those who do nothing.

The present game laws, which prevent the breeding of game on the farms and other private lands, are neither uniform nor permanent. Any one who is familiar with the legislation in any State must be aware that every year (when the Assembly meets) many new bills regu-



ENGLISH WILD FOWLER, OR MARKET GUNNER

lating, and usually restricting, the taking of game are introduced, and often many of them are enacted.

The Governor of a New England State informed me not long ago that one-tenth of the legislation of his State related to fish and game, and recently I read a magazine article which contained the statement that about one-half of the legislative work of a Western State related to fish and game. About eighty new game laws actually were enacted in North Carolina in 1909, and many more, no doubt, were introduced, debated and rejected.

The industry of game law making seems to be on the increase almost everywhere in the United States, and it would seem absolutely ludicrous were it not for the fact that a vast number of fanciful, petty crimes are created which are not founded on the legal principles which should underlie all criminal enactments.* The number of crimes has grown so large that even the best lawyers do not pretend to know them all.

The game birds evidently do not increase in numbers, but, on the other hand, many desirable species seem to be in danger of extirpation more and more as the new crimes are made, and it is evident to all who are familiar with the laws and with the condition of the game that our game laws are not satisfactory.

The wild fowl, as I have observed, must diminish in numbers in populous regions where the marshes are drained and in all places where domestic vermin and trespassers, in addition to the wilder enemies of the ducks, prevent the ducks from nesting—no matter how many laws restricting sport may be enacted. It is an easy matter, as I have observed, for individuals to increase the numbers of

*See article on "Game Law Crimes" in *The Independent*, July 2, 1908.

both the wild fowl and the waders in places where the natural conditions are favorable or where they are made so by private effort. But no one can be expected to do anything which does not pay. It is evident that the State game officers cannot produce game to advantage on private lands, where they are not even permitted to enter, and that they cannot restore the wild fowl and waders to public grounds and waters where the birds cannot nest by reason of the want of the necessary seclusion and safety.

The existing laws have failed not only to keep the markets full of game at reasonable prices, but also to afford good sport for the sportsmen.

Game is a desirable food, and our wild birds are the best in the world, both for the table and for sport. Not long ago they were tremendously abundant, and I have no doubt that some species can be and will be made far more plentiful than they ever were and that they will become an important part of our food supply.

A big economic question is presented, and it requires an able statesman to handle it, since some small politicians seem to believe that the game must be utilized to produce a big revenue and positions for many office holders and that to change the system might be disastrous from a political point of view. On the other hand, the farmers and many intelligent sportsmen and naturalists now entertain the opinion that the profitable increase of game on private lands should be encouraged, and if the issue ever is fairly presented I feel sure that the people will pass upon it rightly at the polls.

In a number of States the State game officers seem to have abandoned our indigenous game, and they are de-

voting their energies to the substitution of foreign species, but without good results. It seems evident that comparatively tame birds cannot be expected to survive in places where the wilder birds, which are better suited to their environment, have perished.

Admitting that the laws which shorten the season limit the bag and prohibit the sale of game do some good, since they delay the extirpation of our indigenous wild food birds, we must also admit that the laws do much harm since they practically prevent the profitable increase of game by breeders. No one can be expected to rear game so long as he is only permitted to take three of his birds in a season and so long as he cannot safely transport them or dispose of them.

The game laws appear to be especially inimical to the farmers, since in many States they cannot either rent their shooting to advantage nor sell any game which may be produced on the farm. Since the farmers have the right to exclude trespassers and are enforcing this right in many places, it would seem desirable for sportsmen as well as farmers to have the laws amended so as to make it profitable to rear game on the posted farms. Those willing to deal fairly with the farmers undoubtedly can obtain permission to breed game on the farms and when they do a large number of sportsmen will shoot on places which are now closed to all shooting, and the shooting on free territory will be benefitted.

A breeders' law should be enacted in every State to encourage the profitable breeding of game. It should define the breeders, and they should secure a license from the State game department permitting them to own the game reared and to shoot it without restrictions during

a long open season and to sell all or any part of it to licensed dealers under regulations which should provide for the listing and identification of the game sold.

Such laws are easily executed in all countries which have game, and the system has been found to work well in Colorado and elsewhere in America where it has been tried.

The able Game Commissioner of Colorado has well said the sale of game and game fish from the licensed parks and lakes in Colorado has put the market gunners out of business, and the people are supplied with game for their tables.

All naturalists, so far as I am aware, and most of the intelligent sportsmen in America who have carefully considered this important question have declared in favor of amendments to the laws permitting the profitable increase of game by breeders. The Bureau of Biological Survey of the U. S. Department of Agriculture favors such legislation, and it seems probable that the laws soon will be amended so as no longer to prevent the profitable increase of a desirable food. I am firmly of the opinion that in a very few years North America will become the biggest game producing country in the world.*

*The history of American game laws and their merit and weakness, and the needed changes in the laws are fully discussed in an article which I wrote for *The Cyclopedia of Agriculture*, Vol. 4. The Macmillan Co., N. Y.



PIN-TAILS

From a drawing by L. A. Fuertes

APPENDIX

THE following accounts of the distribution and migration of the wild ducks which are desirable as food were written by Wells W. Cooke, an assistant of the Biological Survey, U. S. Department of Agriculture (published as Bulletin No. 26.) The mergansers, scoters, eiders, etc., are shot by gunners and sometimes eaten, but they are not desirable as food and will not be bred for sport or for profit.

In his introduction Mr. Cooke says: "The economic value and importance of the birds as food are very great. The flesh not only is palatable and nutritious, but is so different from that of domestic fowls as to form a most welcome addition to the table of the rich and the poor."

Those who undertake to propagate the species which thus far have not been successfully bred on game farms and preserves can study the breeding range of the various species to advantage.

Ducks undoubtedly can be more easily reared in places where they now occur, or where they nested formerly, than in places remote from their habitat, but I have no doubt the breeding range of many species can be much extended by breeders and game preservers and that many species which are not artificially reared may be success-

fully handled; and if so the result of such industry will be highly profitable.

Mr. Cooke says the principal causes of the diminished numbers of water fowl have been market hunting, spring shooting and the destruction of the breeding grounds for farming purposes.

Market shooting safely can be resumed, of course, when the birds are reared in large numbers, and the destruction of the breeding grounds can be prevented when it appears that the duck crop is valuable. Spring shooting will not be done by breeders, of course.

The distribution and migration of the ducks desirable for food as given by Mr. Cooke is as follows:

Anas boschas Linn. Mallard.

Breeding Range.—The northern half of the United States west of Pennsylvania, and the whole of Canada west of Hudson Bay, constitute the principal breeding range in the Western Hemisphere of the mallard—the commonest duck on the North American continent and probably in the world. In eastern North America the place of the mallard is taken by the black duck, and the former is rather rare, though a few breed in eastern Ontario about Lake Erie, locally in western New York and south to Maryland. Though unknown as a breeder on the mainland east of Hudson Bay, the mallard is rather common in Greenland, breeding north to Godthaab and Angmagsalik and wandering to Upernavik. Throughout New England and the Maritime Provinces it is a rare migrant, and while some of the records of its breeding in these districts may be correct, it is no more than a casual summer resident.

In the interior the breeding range extends regularly south to latitude 41° and a few breed south to southern Indiana, southern Illinois, central Missouri and southern Kansas. The breeding range bends south in the Rocky Mountains to southern New Mexico and on the Pacific coast to Lower California (San Pedro Martir Mountains.)

The breeding range extends north to Fort Churchill, to the Arctic coast in the Mackenzie Valley and to Kotzebue Sound and the Fur Seal Islands in Alaska.

The mallard is one of the earliest birds to breed. The nesting season extends from early April in southern California and the first week of May in northern Indiana, to early June in the Mackenzie Valley and the Yukon Delta, and the last week of June in Greenland.

It is one of the common ducks of the Old World, breeding in the Northern Hemisphere and ranging south in winter to central Africa and southern Asia.

Winter Range.—The mallard is a fresh water duck, and in general it winters as far north as open fresh water is found. The greater number spend the winter in the southern half of the Mississippi Valley, and for many years this was the source of a large part of the market supply. The numbers killed were almost incredible. Big Lake, Arkansas, was and still is one of the favorite resorts, and during the winter of 1893-94 a single gunner sold 8,000 mallards, while the total number sent to market from this one place amounted to 120,000. Fortunately both Arkansas and Missouri now forbid market shooting, and this deplorable slaughter has been decidedly lessened.*

*The Biological Survey now favors the sale of game by breeders.

This species winters casually in eastern Massachusetts and central New York, accidentally in Nova Scotia and regularly from Virginia to northern Florida. It is less common in central Florida and has been recorded in the Bermudas, Bahamas, Cuba, Jamaica, Grenada, Carriacou, Panama and Costa Rica. Most of these localities have only one record each, showing that the mallard is only a straggler to the southeast of the United States. There seems to be no record for Central America from Costa Rica to Mexico. The species is a common winter resident of northern Mexico and ranges south to Jalapa, the Valley of Mexico, Colima and southern Lower California.

The northern winter limit in the interior is in Ohio, northern Indiana, southern Wisconsin, Nebraska, Wyoming and central Montana. The species is common in winter along the whole Pacific coast as far north as the Aleutian Islands.

Spring Migration.—It is among the earliest of ducks to move northward and forms a large proportion of the early flocks. The portion of the central Mississippi Valley that forms the extreme winter range is invaded by the spring migrants the latter part of February; Frankfort, Ind. (average for ten years), Feb. 21; central Illinois (twelve years), Feb. 22; central Missouri (sixteen years), Feb. 26; Keokuk, Ia. (nine years), Feb. 24; southern Kansas (eleven years), Feb. 18; southern Nebraska (five years), Feb. 19. Just north of the winter range average dates of spring arrival are: Erie, Pa., March 5; central New York, March 23; Oberlin, O., March 21; southern Michigan, March 9; southern Ontario, March 24; Ottawa, Ont., March 27; Chicago, Ill. (eleven years), March

19; southern Wisconsin (twelve years), March 21; Spirit Lake, Iowa, March 10; Heron Lake, Minnesota, March 11; central South Dakota (fourteen years), March 16; Larimore, N. D. (twelve years), March 28; Terry, Mont., March 26. The mallard crosses into central Canada early in April, and the average date of arrival at Aweme, Man. (ten years), is April 3 (earliest, March 24, 1905); Qu' Appelle, Saskatchewan (six years), April 10 (earliest, March 26, 1905.) The earliest migrants were seen at Fort Resolution May 7, 1860; near Fort Providence, April 27, 1904; Fort Simpson, May 3, 1904; Kowak River, Alaska, May 17, 1899.

The last one seen in 1892 at Shellmound, Miss., was on April 5; in northern Texas one was seen as late as May 6, 1889. In central Missouri, where a few remain to breed, the average date when the last migrants are seen is March 28.

Fall Migration.—In the fall this species returns with the general mass of ducks, and the average date of its arrival at Alexandria, Va., is Sept. 21 (earliest, Aug. 28, 1896); it becomes common Oct. 27; at Chicago, Ill., Sept. 27; Grinnell, Ia., Sept. 17, and in northern Texas Oct. 11. The first one was noted at San Angelo, Tex., Aug. 10, 1883, and at Austin, Tex., Sept. 1, 1893.

The mallard is one of the moderately hardy ducks and remains in the north until the lakes begin to freeze. Average dates when the last were seen are: Montreal, Can., Oct. 26 (latest, Nov. 13, 1897); Scotch Lake, New Brunswick, Nov. 7; Ottawa, Ont. (nine years), Nov. 5 (latest, Nov. 14, 1904); Aweme, Man. (eight years), Nov. 12 (latest, Nov. 23, 1902); Chicago, Ill., Nov. 13; English Lake, Indiana, Dec. 9; southern Minnesota (ten years), Nov.

22 (latest, Dec. 11, 1890); central Iowa (twelve years), Nov. 15 (latest, Nov. 27, 1903); central Nebraska, Nov. 18 (latest, Nov. 26, 1899.)

Anas obscura Gmel. Black Duck.

Breeding Range.—The group of "black," or "dusky," ducks comprises several species which closely resemble each other and which have been distinguished only in recent years. The black duck is the common breeding duck of New England and northern New York, south of which it breeds not rarely on Long Island and locally in Pennsylvania (Bradford County), New Jersey (Long Beach), Delaware and Maryland (Ocean City, Barrow Springs.) To the westward the breeding range extends south to Ohio (formerly), Indiana (Lake County), Illinois, Iowa (Spirit Lake) and Minnesota (Kandiyohi County.) It breeds rarely and locally over much of Wisconsin, but breeds more commonly in Michigan and southern Ontario. It is a very common summer resident of Quebec, New Brunswick, Nova Scotia and the islands of the Gulf of St. Lawrence. The most northern points at which it breeds are in southern Labrador and Newfoundland. Somewhere in Labrador and in northern Ontario this form meets the more northern form, the red-legged duck (*Anas obscura rubripes*), but the dividing line between the two is unknown. A specimen from the Straits of Belle Isle is *obscura*; one from Okak, Labrador, is intermediate and one from Ungava Bay, only a few miles farther north, is *rubripes*.

The black duck breeds so early that young have been found at Old Saybrook, Conn., May 5, and eggs at Rehoboth, Mass., April 30.

Winter Range.—This species is accidental in winter in the West Indies (Jamaica), rare in the Bermudas and rare in central Florida (Gainesville) and also in Alabama. From Georgia northward it is more common, and from North Carolina to New Jersey it is one of the abundant winter ducks. Black ducks, including both *A. obscura* and *A. rubripes*, are abundant at this season around Long Island and on the shores of Rhode Island and Massachusetts, but although a few *A. obscura* winter in Massachusetts, the greater number are *A. rubripes*. West of the Alleghenies there is uncertainty as to which form preponderates in winter. *A. obscura* is a tolerably common winter resident of Louisiana, but *A. rubripes* reaches Arkansas, and one form or the other winters as far north as southern Ohio, southern Indiana and southern Illinois. In migration *A. obscura* is rare west to eastern Nebraska (Fairmont, Gresham, Calhoun) and eastern Kansas (Reno County, Wichita and Lawrence.) Notes on the migration of this species are for the most part included under those of *A. rubripes*.

Anas obscura rubripes Brewst. Red-legged Black Duck.

Breeding Range.—As stated under the last species, a breeding duck from Okak, northeastern Labrador, is considered intermediate between this form and *A. obscura*, while the bird breeding at Ungava Bay is *A. rubripes*. This Ungava Bay record seems to mark the northeastern limit of the species so far as reported. Thence the species extends west to Hudson Bay, as far north at least as Fort Churchill, and is rare or accidental west to Manitoba (Long Lake; Lake Manitoba, Oct. 28, 1900; Delta, Sept. 4, 1902, September, 1903; St. Marks, two, October, 1902),

and to Fort Anderson. The southern limit of the breeding range in Ontario has not yet been determined.

Winter Range.—Most of the black ducks that winter in Massachusetts are *A. rubripes*, and this is about as far north as the species commonly winters. Along the coast some have been known in winter as far north as Nova Scotia. How far south the species goes has not yet been determined, but it is common on the coast of South Carolina from November to March, and a specimen was taken in Mississippi County, Ark., Nov. 5, 1887. It occurs west to Nebraska (Greenwood, Lincoln, Calhoun) and undoubtedly wanders to eastern Kansas. The northern winter limit in the interior is probably from northwestern Pennsylvania to southern Wisconsin.

Spring Migration.—It is impossible to separate the migration records of *A. obscura* and *A. rubripes*. The following migration notes probably refer for the most part to *A. rubripes*, because that form winters farther north. In March extensive northward movements of black ducks occur, but it is not until early April that the birds pass beyond the usual winter range. The average date of arrival for seventeen years in southern Maine is April 7; the earliest, March 19, 1894; the average date for Montreal is April 14, and March 27, 1889, is the earliest; Quebec, average, April 18 (earliest, April 6, 1896); Godbout, Quebec, average, April 21; Prince Edward Island, April 23 (earliest, April 5, 1898.) Farther west the average date of arrival in southern Ontario is April 7 (earliest, March 16, 1901); average at Ottawa, April 14 (earliest, March 21, 1903.)

Fall Migration.—A black duck was seen at Washington, D. C., Aug. 1, 1887; one at Alexandria, Va., Aug. 14, 1886,

and one at Hog Island, Va., Aug. 20, 1886; but these are unusually early records. The average of a long series of excellent records at Alexandria, Va., is Sept. 30 for the arrival of the first and Oct. 31 as the average date when they become common. About the middle of October, on the New England coast, they become common enough to usher in the shooting season. These dates, of course, apply to *A. obscura*. There are no exact records of the time when *A. rubripes* arrives from its northern breeding grounds, but it is supposed that it reaches New England about the first week in October. In winter it remains as far north as it can find open water. The average date when the last leave Ottawa, Ont., is Nov. 7 (latest, Nov. 21, 1892); average at Montreal, Nov. 6 (latest, Nov. 14, 1896.) The last one was seen at Prince Edward Island Nov. 13, 1889, and Dec. 8, 1890.

***Anas fulvigula* Ridgw. Florida Duck.**

A nonmigratory species, breeding commonly in the southern half of Florida, and less commonly in the northern portion. It seems to be absent from northeastern Florida, but occurs along the northwestern coast of the State. Nests in late April and in May, but sometimes much earlier, for downy young have been seen as early as April 6.

***Anas fulvigula maculosa* (Senn.) Mottled Duck.**

Resident in Texas and southern Louisiana (Lake Arthur.) In Texas it occurs from the mouth of the Rio Grande northward and west to about the middle of the State. It is accidental in Kansas (Neosho Falls, March 11, 1876.) It breeds throughout most if not all of its Texas range; the eggs are deposited in April.

Chaulelasmus streperus (Linn.) Gadwall.

Breeding Range.—A large majority of the North American individuals of this species breed in the prairie district extending from Manitoba to the Rocky Mountains, south to western Minnesota and from northern South Dakota north to the Saskatchewan.

The species breeds commonly from the Rocky Mountains to the Pacific, south to southern Colorado, Utah, Nevada and in nearly the whole of California; also probably in the Mogollon Mountains of Arizona. The northern range extends to southern British Columbia, Alberta (rarely or casually to Lesser Slave Lake) and to Fort Churchill on Hudson Bay. There is no authentic record for the Mackenzie Valley, and if the specimen in the British Museum labeled "Bering Straits" really was captured there it was a wanderer, as was also one taken at Unalak, March 18, 1879.

In the Mississippi Valley the gadwall occasionally breeds in northern Nebraska and rarely in Kansas. Formerly it bred in Wisconsin (Horicon Marsh and Lake Koshkonong), there is one record for Ontario (St. Clair Flats) and one for Anticosti Island. It is only a straggler to New England and the Maritime Provinces north to Quebec and Newfoundland, and east of the Mississippi is rare north of North Carolina.

The gadwall is a common breeder in Europe and Asia, ranging south in winter far into Africa and to southern Asia.

Winter Range.—The principal winter home of the gadwall is in the lower Mississippi Valley, especially Texas, Louisiana and Arkansas. It rarely winters as far north as Illinois, but is more common to the eastward in North Carolina and Florida; accidental in Cuba (twice), Ja-

maica and the Bermudas. The winter range extends to the southern end of Lower California, to Mazatlan and the City of Mexico. In northern Mexico the species is common through the winter, and birds have been found paired in May, the late date indicating that they intended to remain and breed. Thence it extends commonly to Utah and Oregon, rarely to Washington and British Columbia.

Spring Migration.—Only a few notes on the migration of this species have been recorded. The average date when the first spring migrants reach southern Iowa is March 18 (earliest, March 10, 1896), it thus being one of the earlier ducks in this part of its range. It reached Heron Lake, Minn., April 1 (earliest, March 17, 1886); Loveland, Colo., March 6, and Terry, Mont., about April 1. The first migrant was seen at Aweme, Man., April 23, 1898, and at Indian Head, Saskatchewan, April 18, 1892, and April 24, 1904. Eggs have been secured at St. Clair Flats, Ontario, about May 30; in western Minnesota, June 14, 1879; northern North Dakota, June 15, 1901; Manitoba, June 5, 1894; Crane Lake, Saskatchewan, June 9, 1894; Nevada, May 29, 1868, and incubated eggs in Los Angeles County, California, April 16.

Fall Migration.—The first arrived at the southern end of Lower California Sept. 27, 1887; in northern New Mexico the species was abundant the last days of September, 1904. The average date when the last left central Minnesota was Nov. 14.

Mareca americana (Gmel.) Baldpate. American Widgeon.

Breeding Range.—A line drawn from the western shore of Hudson Bay to the western shore of Lake Michigan

marks, approximately, the eastern boundary of the breeding range of this species, and in the eastern 200 miles of this district it is decidedly uncommon during the nesting season. There are a few records of the bird's breeding in Indiana (Hogback Lake, English Lake) and in Wisconsin (formerly at Koshkonong and Horicon), but not until Minnesota is reached does this duck breed commonly. West of the Mississippi it breeds abundantly in North Dakota, a few in southern South Dakota and rarely or casually in Nebraska and Kansas. It is a common breeder in Colorado, Utah and Nevada (Truckee Valley), and probably breeds rarely in Arizona (Mormon Lake), but as yet the species has not been recorded as nesting in California. The main breeding range is northwestern North America from Oregon and Minnesota north to the Mackenzie Valley and central Alaska. A line from Fort Churchill, Hudson Bay, to Franklin Bay is the approximate northeastern boundary of the range, thence west to Kotzebue Sound. If this line from Franklin Bay to Fort Churchill is continued to Chesapeake Bay, it marks the approximate eastern limits at which the species is common in migration. Northeastward the species is known as a rare migrant, in New England hardly more than a straggler, but it has been recorded as far as Newfoundland, southern Labrador (Natashquan) and northern Ontario (Moose River.) The baldpate is rather rare on the coast of Alaska, but is more common in the interior and is a rare or casual visitor to the Near, Commander and Bermuda Islands.

Winter Range.—The baldpate is common on the Chesapeake in winter, but as it is rare directly to the northward at all times of the year, it is evident that the migration is

from the northwest. Occasionally birds are found in winter as far north as Rhode Island. The species is common during the winter in the Carolinas, less common in Florida and Cuba and rare in the Bermudas, the Bahamas, Jamaica, Porto Rico, St. Thomas and Trinidad. It is recorded from Costa Rica and is a rather common winter resident of northern Guatemala and much of Mexico north of the Valley of Mexico. The winter home in the Mississippi Valley extends north to Illinois and in the west to New Mexico, Arizona, Utah (probably) and to southern British Columbia. It is probably most common during the winter along the Pacific coast.

Spring Migration.—This begins late in February, and by early March the species is north of its winter home. Average dates of arrival are: Western New York, March 23; Erie, Pa., March 24; Oberlin, O., March 17; southern Michigan, March 25; Keokuk, Ia., March 15; central Nebraska, March 17; Loveland, Colo., March 10. The further advance of the species is somewhat slow. The average time of reaching Heron Lake, Minn., is March 29; southern Manitoba, April 20; Terry, Mont., April 8. The first individual was seen at Indian Head, Saskatchewan, April 24, 1904, and at Osler, Saskatchewan, May 2, 1893. These dates indicate an average speed of seventeen miles per day from central Nebraska to Heron Lake and eighteen miles per day thence to southern Manitoba. The average rate from Colorado to Montana is sixteen miles per day, and the same rate continued northward would bring the first baldpate to Indian Head and Osler at almost exactly the stated dates. If the birds of the Mississippi Valley pass northwest to the Mackenzie Valley, this rate of migration would bring them to Great

Slave Lake about the first week in June, whereas the first arrival at Fort Simpson, Mackenzie, was April 28, 1904; and a female was shot at Fort Resolution May 24, 1860, which contained a fully formed egg. It is evident, then, that the earliest arrivals in the Mackenzie Valley come from the southwest, where, in southern British Columbia, the species winters a thousand miles farther north than on the plains. The baldpate arrives at the mouth of the Yukon in early May, and on the Knik River, Alaska, the first bird was noted May 10, 1901. Most of the few spring records in New England are in April, two in February, but the species is apparently less common in the spring than in the fall. The last migrants usually leave Cuba late in April, though in Guatemala they have been seen as late as May.

Fall Migration.—The month of September, especially the latter half, sees the arrival of the first baldpates over most of the district between the breeding grounds and Cuba and Louisiana; but these are only the advance scouts; the main body appears in the northern United States early in October and reaches the middle Atlantic States about the middle of that month. Dates of arrival are: Middletown, R. I., Sept. 20, 1889; East Hartford, Conn., Sept. 29, 1888; Beaver, Pa., Aug. 30, 1890. Stragglers have been seen in Massachusetts and in northern Pennsylvania as late as the first week in December, but most leave at least a month earlier. The average date at which the last were seen at Ottawa, Ont., is Oct. 27, latest Nov. 6, 1890; at Keokuk, Ia., Nov. 13, latest Nov. 18, 1892. The last was seen at Montreal Sept. 20, 1897; Edmonton, Alberta, Nov. 6, 1896; Kowak River, Alaska, Sept. 20, 1898; St. Michael, Alaska, Oct. 1.

Nettion carolinense (Gmel.) Green-winged Teal.

Breeding Range.—A few probably have bred in the mountains of north central Pennsylvania (Lycoming County), and it has been reported as nesting near Buffalo, N. Y. The regular breeding range extends from New Brunswick, through northeastern Quebec and Newfoundland, to Ungava Bay, Labrador, latitude 58°. It is a common migrant in Ontario, and hence undoubtedly breeds in the northern part. It has been recorded as a rare breeder in southern Ontario (Toronto, Point aux Pins, Oshawa, Gravenhurst.) The southern boundary of the breeding range to the westward is found in Illinois (Rockford, Lacon, Fernwood), in Michigan (Neebish Island), Wisconsin (Lake Koshkonong, formerly), Minnesota (Faribault, Heron Lake), Nebraska (Dewey Lake, Badger, Valentine), Colorado (Beloit, San Luis Valley), New Mexico (San Miguel County), Utah (Salt Lake), Nevada (Washoe Lake), Oregon (Fort Klamath.) The range extends north to the edge of the Barren Grounds from near Fort Churchill, Hudson Bay, to Fort Anderson, to Kotzebue Sound and nearly to Point Barrow. It breeds throughout the Aleutian Chain to the Near Islands. It is rare as a breeder everywhere in the United States east of the Rocky Mountains, and the main breeding grounds are in west central Canada from Manitoba to Lake Athabaska. It has wandered a few times to the west coast of Greenland, from Nanortalik to Disco Bay, and was once taken in May on the east coast at Nanusek. The species is accidental in Great Britain, the Bermudas and Hawaii.

Winter Range.—South of the United States it is common in Mexico, at least as far as Jalapa, the City of Mex-

ico, Michoacan and Jalisco; common also in the Bahamas and rare in Cuba, Jamaica and Honduras. It has been recorded on the islands of Carriacou, Grenada and Tobago, of the Lesser Antilles.

It is one of the most abundant ducks throughout the southwestern United States during winter. It is a hardy duck and in general remains as far north as it can find open fresh water. Thus it winters in western Montana (Great Falls), central Utah, southern Nebraska, southern Iowa, central Illinois, central Indiana (rarely Lake Michigan), western New York and Rhode Island. It is accidental in Massachusetts in winter, and one was found at Halifax, Nova Scotia, Jan. 14, 1890. The principal winter home in the Mississippi Valley lies south of 37° latitude.

Spring Migration.—The green-winged teal is one of the early migrating "river ducks," but not quite so early, by about five days, as the mallard. Along the Atlantic slope it passes north of its winter home in early March, and the average date of its arrival in southern Pennsylvania is March 16; southern Connecticut, April 6; Montreal, Canada, April 27; Prince Edward Island, April 26.

The average date of the first arrivals in central Missouri is Feb. 26; central Illinois, March 7; English Lake, Ind., March 15; Keokuk, Ia. (average for twelve years), March 3; central Iowa (fourteen years), March 11; Heron Lake, Minn. (six years), March 24 (earliest, March 6, 1887.) In its migration along the eastern border of the plains the green-winged teal is noted at Onaga, Kans., March 8; northern Nebraska, March 12; central South Dakota, March 20; northern North Dakota, April 6; Aweme, Man., April 16, and southern Saskatchewan, April 19. These dates indicate the rather slow rate of

only eighteen miles a day. The average of five years' records of arrival at Terry, Mont., is March 23; a date about ten days earlier than that at which the species appears in the same latitude in Minnesota. Its winter home on the Pacific coast extends 1,500 miles farther north than on the Atlantic, and hence it is not surprising that the bird has been seen on the middle Yukon by May 3 and at the mouth of the Yukon by May 10.

South of the breeding range the last green-winged teal was seen at Raleigh, N. C., April 13, 1900; Hester, La., April 6, 1902; northern Texas, April 16, 1886. The average date of disappearance for eight years at Keokuk, Ia., is April 7, latest, April 30, 1892.

Eggs were taken at Nulato, Alaska, latitude 65°, May 20, and no earlier date seems to be recorded for the regions to the south. Eggs have been found at Edmonton, Alberta, latitude 54°, May 27, and in southern Ontario, latitude 45°, May 22. Downy young were seen in the Devils Lake region of North Dakota June 20.

Fall Migration.—An average date for the reappearance of the green-winged teal at Erie, Pa., is Sept. 15 (earliest, Sept. 1, 1894); at Alexandria, Va., Sept. 29 (earliest, Sept. 22); but it is not considered common until early November. Corresponding dates of arrival are: Keokuk, Ia., Sept. 21; central Kansas, Sept. 12; central Texas, Sept. 22; central California, Sept. 17. The last was noted on Prince Edward Island, Nov. 4, 1890; Montreal, Can., Nov. 1, 1893; Aweme, Man., Oct. 30, 1896; Kowak River, Alaska, Sept. 3, 1898; St. Michael, Alaska, the first week in October. The average date of the last seen in southern Ontario (thirteen years) is Oct. 28 (latest,

Nov. 7, 1890); at Keokuk, Ia. (seven years), Nov. 22 (latest, Nov. 27, 1902.)

Querquedula discors (Linn.) Blue-winged Teal.

Breeding Range.—The principal summer home of this teal is the interior of North America between the Rocky Mountains and the Great Lakes, from northern Illinois and central Iowa north to Saskatchewan. The species is not common east of the Allegheny Mountains nor on the Pacific slope. It has been recorded as breeding rarely in Rhode Island (Sakonnet, 1890), Maine (Calais), New Brunswick (Kings County, St. John County), Nova Scotia, Anticosti Island and Newfoundland, Quebec (Montreal, Point de Monts), Ungava (Clearwater Lake, latitude 57°), rare in southern Ontario (Toronto), New York (Utica, Auburn, Buffalo, formerly Long Island, Black Pond, Ulster County.) It breeds as far south as northern Ohio (Port Clinton, Sandusky), southern Indiana (Gibson County and Wheatland), southern Illinois (Anna), central Missouri (Kings Lake, Warrensburg, Kansas City), central Kansas (Emporia, Wichita, Medicine Lodge, Fort Hays)—casual or accidental breeding at Fort Reno, Okla., and San Antonio and Spring Lake, Texas—southern Colorado (Fort Garland and La Plata County), New Mexico (Santa Rosa; Black Lake, Colfax County; Chloride), probably in Arizona (Mogollon Mountains), central Utah (Thistle Valley, Fairfield, northern Nevada (Truckee Valley, Washoe Lake, and central Oregon (Burns.)

The breeding range extends north to central British Columbia (Lac la Hache, 158-Mile House); but the bird is rare or accidental in Alaska (Cape Romanzoff),

Alberta (Edmonton), and on Great Slave Lake. Much remains to be learned in regard to the nesting of the blue-winged teal in the West Indies and Central America. It breeds in Jamaica and in the Lesser Antilles, quite probably also in Honduras and in western Mexico (Mazatlan), near the southern end of Lower California.

The resident teal of Jamaica probably should be separated subspecifically as *Querquedula discors inornata* (Gosse), but the eastern and western boundaries of this form remain to be determined.

Winter Range.—Blue-winged teal migrate over a vast extent of territory, and are found in winter throughout northern South America south to Brazil, Ecuador, Peru and Chile. They occur abundantly in Central America, Mexico and the West Indies, and are equally common during the winter in the Gulf States and north to North Carolina. In the Mississippi Valley few remain much north of the Gulf, though these few are scattered widely as far as southern Indiana and southern Illinois; a few winter in Arizona, and the small number of Pacific coast birds spend the winter in California and north to southern British Columbia.

North of North Carolina this teal can hardly be called a common winter species, though it is not rare on Chesapeake Bay and winters even as far north as Delaware. This species is one of the least hardy of our ducks, and few individuals remain where there is cold and ice.

Spring Migration.—The blue-winged teal is among the latest ducks to migrate. The first was noted at Erie, Pa., March 27, 1898; Templeton, Mass., April 1, 1898; Prince Edward Island, April 20, 1888. In central Iowa, where the hardy ducks appear in February, the blue-winged teal

was noted on the average (ten years) March 26 (earliest, March 18, 1899); northern Iowa, April 4, and Heron Lake, Minn., April 9. The records of Heron Lake are quite uniform—April 11, 1885; April 11, 1886; April 10, 1887, April 8, 1888; April 9, 1889, April 7, 1890. These dates indicate less variation in the time of arrival of this species than of any other. The blue-winged teal appears in southeastern Nebraska, March 28; central South Dakota, April 2; central North Dakota, April 12; northwestern Minnesota, April 23; Aweme, Man., April 27.

In southern Texas this teal becomes common in spring about the middle of March; about the first week in April is the height of the shooting season in southern Louisiana. The latest migrants have been noted at Gainesville, Fla., April 29, 1887; Baltimore, Md., May 7, 1890; New Orleans, La., May 21, 1898; San Antonio, Tex., May 14, 1902. Eggs have been taken at Canton, Ill., May 16, 1897. Eggs just hatching were found on the Magdalen Islands, Gulf of St. Lawrence, June 16, 1900, and fresh eggs at Waseca, Minn., June 1; in North Dakota, June 12; and at Reaburn, Man., June 4, 1894.

Fall Migration.—The blue-winged teal is one of the earliest ducks to move southward; during the month of August it reappears throughout the northern half of the United States and some especially early birds almost reach the Gulf of Mexico. During a period of fourteen years the average date of arrival at Alexandria, Va., was Aug. 31 (earliest, Aug. 18, 1889); they become common on the average Sept. 23, though in the fall of 1887 they were already numerous Sept. 10. The average date of arrival in central Kansas is Sept. 12, and in southern Mississippi Sept. 16.

The average date at which the last was seen at Montreal was Sept. 25; latest, Sept. 29, 1888; the last one seen on Prince Edward Island in this same year was Oct. 8; Lewiston, Me., Nov. 7, 1901; Cape May, N. J., Dec. 5, 1884.

The average date for eight years when the last one was seen at Ottawa, Ont., is Oct. 13 (latest, Oct. 27, 1894); Chicago, Ill., Oct. 18 (latest, Oct. 22, 1904); southern Iowa, Oct. 22 (latest, Nov. 4, 1885; central South Dakota, Oct. 7; eastern Nebraska, Nov. 11; central Missouri, Nov. 6 (latest, Nov. 13, 1902). The last one seen in 1896 at Aweme, Man., was on Oct. 30. During the fall migration the blue-winged teal is fairly common on the Bermudas, but it rarely occurs there in spring.

***Querquedula cyanoptera* (Vieill.) Cinnamon Teal.**

Breeding Range.—The breeding range of the cinnamon teal differs essentially from that of almost every other duck in the Western Hemisphere. It consists of a large area north of the equator and a similar district south of the equator, and these two homes are separated by a strip about 2,000 miles wide, in which the species is practically unknown. In North America the breeding range extends north to southern British Columbia (Lac la Hache) and southwestern Alberta; east to eastern Wyoming (Lake Como, Cheyenne), western Kansas (Fort Wallace, Meade County); south to northern Lower California (La Grulla, San Rafael Valley, and possibly San Jose del Cabo), northern Mexico (Chihuahua City), southern New Mexico (Carlsbad), and southwestern Texas (Marathon, Rock Spring.)

The cinnamon teal occurs sparingly in migration as far east as Houston, Tex., and Omaha, Neb. It has been noted as accidental at Oak Lake, Manitoba; Big Stone Lake, Minnesota; Lake Koshkonong, Wisconsin; Licking County Reservoir, Ohio; Seneca River and Seneca Lake, New York; Lake Pontchartrain, Lake Cattawatchie, St. Malo, and Opelousas, La.; Mount Pleasant, S. C.; Lake Iamonia and Key West, Fla.

Throughout this breeding area the eggs are deposited during May and June. About six months later the South American colony breeds. The breeding range includes the pampas of Argentina as far north as Buenos Aires, while in the Andes it extends north to central Peru (Santa Luzia.) Southward the species breeds as far as the Falkland Islands and the Straits of Magellan. These South American breeders, of course, are not the same birds which nest in North America, for it is true, without exception, that no bird which breeds north of the equator breeds also in the Southern Hemisphere.

Winter Range.—The cinnamon teal of North America retires in winter but little south of its breeding range in Mexico as far as Mazatlan, Guanajuato, and the Laguna de Chapulco, Puebla. It is found at this season as far north as Brownsville, Tex., central New Mexico, southern Arizona, and Tulare Lake, California. South of Mexico the only record is of an accidental occurrence in Costa Rica. There is no reliable record as yet for the West Indies.

During the winter season the cinnamon teal of the Southern Hemisphere has been noted as far south as the mouth of the Senger River, in Patagonia, latitude 44° S., and Chiloe Island, Chile, in nearly the same latitude. The

northern range in winter is not determinable with exactness from present data. The species passes north to Rio Grande do Sul, Brazil, and to southern Paraguay. It has been noted at Chorillos and Tungasuca, Peru; near Quito, Ecuador; at Bogota and Santa Marta, Colombia. These Ecuador and Colombia teal may be accidental occurrences; it is significant, at least, that all the specimens from Colombia were taken a half a century ago, and the species has not been noted there by recent collectors.

Spring Migration.—The northward movement of the cinnamon teal in the United States begins about the 1st of March, and arrivals have been noted at Ash Meadows, Nev., March 18, 1891; Grangeville, Ida., April 11, 1887; Chilliwack, British Columbia, April 24, 1888, and April 22, 1889; Beloit, Colo., March 23, 1892; Colorado Springs, April 9, 1882; Loveland, Colo., April 13, 1890; Lay, Colo., April 20, 1890; Omaha, Neb., April 10, 1896, and April 12, 1897; Lake Como, Wyoming, about May 5.

Fall Migration.—Southward migration occurs chiefly in September, and the northern portion of the breeding grounds from British Columbia to eastern Colorado is deserted about the middle of October.

***Spatula clypeata* (Linn.) Shoveller.**

Breeding Range.—The principal North American summer home of the shoveller is in the prairie region of the interior, from a little south of the Canadian border, north to the Saskatchewan. Throughout this region it is common. To the eastward it is rare. It is scarcely common as far as Hudson Bay; nor is it common east of a line from southeastern Michigan to the mouth of Chesapeake

Bay, in which latter region it is found only in migration and in winter. In the Maritime Provinces of Canada, and even north to Newfoundland, the shoveller has been recorded as a rare or casual visitor; but reliable breeding records from this region seem to be lacking. It is rare as a breeder in southern Michigan, and to the eastward is almost accidental in summer, though it has been known to breed at English Lake, northwestern Indiana, and at Long Point, on the north shore of Lake Erie. The regular breeding range extends south to northern Iowa and southern South Dakota; thence southward it breeds rarely and locally in Nebraska and Kansas, and during the summer of 1905 one of the parties of the Biological Survey found it breeding near East Bernard, about latitude $29^{\circ} 30'$, in southeastern Texas. In the western United States the species breeds commonly from Colorado to northern California, and rarely in New Mexico (Santa Rosa), Arizona (Mogollon Mountains), and southern California (Los Angeles County.) On the southern coast of Texas the species is not uncommon all summer, though these summer residents are probably nonbreeders. Mated birds have been found in May in northern Chihuahua, Mexico, and at the southern end of Lower California, and it is not improbable that the species may breed locally in these districts, and even south to Lake Chapala, Jalisco.

The northern limit of the usual breeding range is from the valley of the Saskatchewan to central British Columbia. The species is a rare breeder thence northward to the edge of the Barren Grounds, casually to Fort Anderson and Fort McPherson. It is rather rare in the Yukon region, but has been known to breed at Fort Yukon,

Nulato, and along the west coast of Alaska from the mouth of the Kuskokwim River to Kotzebue Sound. The shoveller has a wide range in the Eastern Hemisphere, breeding north about to the Arctic Circle, and retiring in winter to northern Africa and southern Asia.

Winter Range.—A few pass south in winter to Colombia, South America (Medellin, Bogota), Panama, Costa Rica, and through the West Indies (Cuba, Jamaica, Porto Rico, St. Thomas, Barbados and Trinidad.) It is rare in Florida, and seems not to have been noted in the Bahamas. The Carolinas are the only place on the Atlantic coast where the species is common. It is not rare in Maryland, and there are a few winter records for New Jersey. The greater portion of the species winters in the southern Mississippi Valley, north rarely to southern Illinois—accidental Jan. 11, 1892, at Lanesboro, Minn.—and south through Mexico to central Guatemala; indeed many hundreds of thousands are said to winter near Lake Chapala, Jalisco. At this season it is found in New Mexico, Arizona, all of California, and less commonly north on the Pacific coast to southern British Columbia. Numbers winter in the Hawaiian Islands. During flight between the winter and summer home it passes through the northeastern United States, not rarely through Pennsylvania and New York, and formerly it was not rare in Massachusetts; but for the last fifteen years there has been hardly more than a single record a year for the whole of New England.

Spring Migration.—Records of the movements of this species are not numerous enough to permit exact statements. Migration begins late in February, but is slight before the middle of March, at which time the species

begins to appear north of its winter range. Average dates of arrival are: Central Illinois, March 23; central Iowa, March 23 (average of sixteen years); Heron Lake, Minn., March 26; central Nebraska, March 25; central Colorado, March 12; vicinity of Chicago, Ill., April 16; southeastern Minnesota, April 9; central North Dakota, April 13; southern Manitoba (twelve years), April 21; Terry, Mont., April 13. The first were seen near Edmonton, Alberta, May 1, 1901; Fort Chipewyan, Mackenzie, May 7, 1893; Fort Resolution, Mackenzie, May 18, 1860, and at the mouth of the Yukon River the second week in May. The general time of breeding can be learned from the following dates: Haywards, Cal., eggs April 25, 1901; East Bernard, Tex., downy young May 14, 1905; Fort Snelling, Minn., eggs May 23; North Dakota, incubated eggs June 7; Oak Lake, Manitoba, eggs May 24, 1892.

Fall Migration.—An individual seen at Erie, Pa., Sept. 6, 1893, marks about the beginning of fall migration, and soon after this, by the middle of the month, the earliest migrants have reached the mouth of the Mississippi River. The larger portion has departed from the northern United States by the middle of October, and the region just north of the winter range is deserted early in November. South of the United States, at the southern end of Lower California, the first arrivals have been recorded Oct. 18; Guaymas, Mexico, November; Panama, Oct. 16; Cuba, September; Jamaica, November; Trinidad, December.

***Defila acuta* (Linn.) Pin-tail.**

Breeding Range.—This is a common breeding duck throughout a wide stretch of country from North Dakota

to the Arctic Ocean and Alaska. The western shores of Hudson Bay seem to be the eastern limit of the normal breeding ground in North America. A few birds have been seen in Labrador, north to Ungava Bay, on the west coast of Greenland, north to Upernavik, and also in Newfoundland and the Maritime Provinces. But there are only a few breeding records east of the line from the western side of Hudson Bay to the western shore of Lake Michigan; examples are: St. George Island, James Bay; St. Clair Flats, Ontario, and the north shore of Lake Erie. Breeding abundantly along the northern border of the United States from Lake Superior nearly to the Pacific Ocean, the species decreases in numbers southward until it is rare or casual as a breeder in southern Wisconsin, northern Illinois (Will, Calumet Marsh, Grass Lake); southern Minnesota (Faribault, Waverly, Heron Lake); northern Iowa (Hancock County); southern South Dakota (Vermilion, Scotland, Running Water), and northern Nebraska (Kennedy, Hay Lake); accidental near Kansas City, Mo.; abundant in Montana and rare in Wyoming (Lake Desmet), Colorado (Larimer County), and probably Arizona (Mormon Lake); common in British Columbia, and rare and local through Washington (Mabton) and Oregon (Rock Creek Sink) to southern California (Alamitos.) The northern limit of the breeding range extends from the Arctic coast northwest of Hudson Bay west to Alaska and the Siberian coast.

The pin-tail breeds in the northern portions of the Old World and migrates south in winter to northern Africa and southern Asia. A few have been taken in the Bermudas in the fall and winter.

Winter Range.—The pin-tail is common in winter on the coast of North Carolina, and is not uncommon coast-wise as far south as Florida; many spend the winter in Cuba, a few pass to Jamaica, and there is one record of the species in Porto Rico; it is one of the common winter ducks from Mexico to Costa Rica, rare in Panama; a few winter as far north as Pennsylvania and New Jersey, while accidentals in winter have been recorded from Long Island and Lynn, Mass. Only a few winter in the Mississippi Valley north of southern Illinois, and thence the winter home extends through Texas, New Mexico, and Arizona to the Pacific coast, where it is abundant at this season as far north as southern British Columbia. The species winters casually in southern Ohio and southern Indiana, while of late years it has become a regular local winter resident in southern Wisconsin.

Spring Migration.—The pin-tail vies with the mallard in the earliness of its spring movements; these two, with the Canada goose, are among the first of the water fowl to wing their way northward. Even in February, while winter still holds sway, restless adventurers appear in much of the region, which, except in a few favored spots, forbids residence through the winter. The average date of arrival of these birds in central Indiana (fourteen years) is Feb. 21; southern Illinois (twelve years), Feb. 26; central Missouri (fourteen years), Feb. 26; Keokuk, Ia. (fourteen years), Feb. 18; central Kansas (seven years), Feb. 21; southern Nebraska (five years), Feb. 23. Farther north average dates of arrival are: Erie, Pa., March 11 (earliest, Feb. 23, 1891); northwestern New York, March 25 (earliest, Feb. 25, 1902); southern Ontario, April 18; Ottawa, Ont., April 30; Montreal, April

23; Prince Edward Island, April 24. The late arrival of this species in eastern Canada is noteworthy, for by the time it reaches there, late April, in the interior it has penetrated a thousand miles farther north. Along this latter route average dates of appearance are southern Michigan, March 18; vicinity of Chicago (thirteen years), March 20 (earliest, March 12, 1893.) The normal time of arrival in central Iowa, as deduced from copious records for twenty years, seems to be March 6, but in twelve of these years one station or another reported unusually early birds, the average date of arrival of which is Feb. 21. The average date when southern Minnesota is reached is (fourteen years) March 9 and northwestern Minnesota (four years) April 8. On the plains the average dates are: Northern Nebraska, March 5; southern South Dakota, March 8; central South Dakota, March 17; Larimore, N. D., April 3 (earliest, March 20, 1889); Reaburn, Man., April 8 (earliest, April 5, 1900); Qu'Appelle, Saskatchewan, April 10 (earliest, March 25, 1905); Great Slave Lake, Mackenzie, about May 1; Fort Confidence, May 22, 1849. A very early bird was seen at Fort Simpson, Mackenzie, April 28, 1904. Nearer the Rocky Mountains, the average date at Terry, Mont., was April 1 (earliest, March 10, 1902); Great Falls, Mont., March 16 (earliest, March 10, 1889); Edmonton, Alberta, April 7, 1887; St. Michael and Nulato, Alaska, about May 1; Kowak River, Alaska, May 14, 1899; Point Barrow, Alaska, June 18, 1882.

The pin-tail not only migrates early, but it is also among the earlier ducks to breed, as evidenced by the following data: Will, Ill., eggs, May 10, 1877; Calumet

Marsh, Illinois, fresh eggs, May 29, 1875; Hancock County, Iowa, eggs, May 1, 1879; Hay Lake, Nebraska, half-grown young, June 17, 1902; North Dakota, eggs, early May, young, first week of June; Oak Lake, Manitoba, incubated eggs, May 24, 1892; near Lake Athabaska, eggs nearly hatched, June 8, 1901; Nulato, Alaska, beginning to breed May 20; Circle City, Alaska, downy young, July 10, 1903; Kowak River, Alaska, first eggs, June 1, 1899.

Fall Migration.—As is true of most ducks, there is a southward movement in August, but it is not until early September that many appear south of the breeding grounds, and in the course of two weeks a few birds find their way even to the Gulf of Mexico, arriving there by the middle of September. Some early dates are: Erie, Pa., Sept. 6, 1893; Alexandria, Va., Sept. 13, 1890; Long Island, Sept. 15, 1903; Rhode Island, Sept. 4; eastern Massachusetts, Sept. 11; Montreal, Sept. 3. The main flight is a whole month later, bringing the birds in large numbers to Chesapeake Bay the middle of October and to the coast of North Carolina late in that month. Some very early migrants have been seen in west central Texas Sept. 4; at Corpus Christi, Tex., Aug. 18, 1902, and at the southern end of Lower California, Aug. 29. The last ones leave the Arctic just about the time the first reach the Gulf of Mexico; the last were noted at Point Barrow, Alaska, Sept. 7, 1882; Kowak River, Alaska, Sept. 14, 1898; St. Michael, Alaska, Oct. 10; Fort Franklin, Mackenzie, Sept. 27, 1903. Large flocks begin to leave southern Minnesota the middle of October, and most have departed by the 1st of November.

Aix sponsa (Linn.) Wood-duck.

Breeding Range.—The wood-duck is more closely confined to the United States than any other North American duck. South of this country it is not a rare resident in Cuba and is accidental in Jamaica and the Bermudas. It occurs in California south to Los Angeles and Ventura counties, in the latter of which it breeds. There is a single record for Mexico, at Mazatlan. It breeds in eastern Texas, south rarely to San Antonio; thence to the Pacific slope and north throughout the whole Rocky Mountain region it is rare or accidental. It is recorded as breeding in southwestern Colorado (Fort Lewis), northern Idaho (Fort Sherman), northern Montana (Flathead Lake), and as a rare migrant in various localities south to New Mexico and Arizona.

The northern extension of its range is found in Nova Scotia and New Brunswick, for the species is not yet recorded from Newfoundland, and there seems to be no reliable record for Labrador. It ranges at least as far north as Montreal, Ottawa, Moose Factory, Trout Lake and Cumberland House. It appears to be absent from the Rocky Mountain region of Canada, but occurs in southern British Columbia (Agassiz, Sumas, Chilliwack and Burnaby Lake.)

It is one of the earliest ducks to breed, as young were found in northern Florida on March 19, 1877.

Winter Range.—The southern range in winter has already been given; northward the species winters regularly to North Carolina, occasionally in Maryland and Pennsylvania; accidentally in New York and Massachusetts. In the interior it is found at this season as far north as southern Indiana, southern Illinois and Kansas.

On the Pacific coast a few winter near the northern limit of the summer range.

Spring Migration.—This duck is one of those which migrate north moderately early, and in central New York the average date of its arrival is March 25 (earliest, March 16, 1898); eastern Massachusetts, March 24; Montreal, Can., April 24; central Iowa, March 20 (earliest, March 7, 1898); northern Ohio, April 1 (earliest, March 10, 1887); Petersburg, Mich., March 15; southern Ontario, April 17 (earliest, April 1, 1890); Ottawa, Ont. (average fifteen years), April 22 (earliest, March 26, 1898); Heron Lake, Minn., April 4 (earliest, March 24, 1890); Elk River, Minn., April 6 (earliest, April 4, 1885); southern Manitoba, April 15 (earliest, April 2, 1895.)

Fall Migration.—The southward migration amounts to no more than withdrawal from the northern half of the summer range. This occurs largely during October, and the average date when the last migrants are seen at Ottawa, Ont. (fourteen years), is Oct. 27 (latest, Nov. 7, 1896); Montreal, Nov. 1; southern Maine, Oct. 27 (latest, Nov. 2, 1896; southern Iowa, Nov. 9 (latest, Nov. 21.)

***Aythya americana* (Eyt.) Redhead.**

Breeding Range.—The greater number of redheads summer in a rather restricted area in western central Canada, comprising western Manitoba, Alberta and Saskatchewan. The species breeds not rarely in the northern portions of Minnesota, North Dakota and Montana. It is less common in southern Minnesota (Madison, Heron Lake), southern South Dakota (Harrison, Vermilion), Idaho (Lake Hoodoo), and on the Pacific slope locally from Lac la Hache, British Columbia, south to southern

California (Ventura and Los Angeles counties), and east to Ruby Lake, Nevada, and Rush Lake, Utah. The red-head used to breed not uncommonly in the great marshes of the lake region of southeastern Wisconsin, but now it is restricted to a few localities, one of which is Lake Koshkonong. It has bred on the St. Clair Flats of Michigan and Ontario.

Only a few pass as far north as 54° latitude, the northern range of the species thus being more restricted than that of any other Canadian duck. A stray was taken in 1896 on Kadiak Island, Alaska, the only record on the Pacific coast north of Vancouver Island, and an individual was taken in the fall in southeastern Labrador. It is not yet recorded in Newfoundland, and is a rare migrant in the Maritime Provinces.

***Aythya vallisneria* (Wils.) Canvasback.**

Breeding Range.—The district just east of the Rocky Mountains in Alberta seems to be a center of abundance of this species in the breeding season. East of this district it breeds commonly to about the one hundredth meridian; south to the southern boundary of Canada, west to central British Columbia and Sitka, north to Great Slave Lake, and northwest to Gens de large Mountains and Fort Yukon. It does not commonly breed in the United States, but a few nest in northern North Dakota and in diminishing numbers southward to Nebraska (Cody, Irwin, Hackberry Lake); it is rare as a breeder in Minnesota (Madison, Heron Lake), and a few crippled birds have been known to breed on Lake Koshkonong, Wisconsin. In 1900 it bred casually at Barr Lake, near Denver, Colo., and it has been known to

breed at Pyramid Lake, Nevada, and in a few places in Oregon.

Aythya marila (Linn.) Scaup Duck; Broadbill; Black-head; Bluebill.

Breeding Range.—The principal summer home of the scaup in the Western Hemisphere is northwestern North America, from northern North Dakota, southeastern British Columbia and Sitka, Alaska, north to Fort Churchill, Great Slave Lake, Fort Reliance, Alaska, and Kotzebue Sound; also throughout the whole Aleutian chain to the Near Islands. It breeds accidentally or casually at Mount Vernon, Va., 1881; Magdalen Islands, Gulf of St. Lawrence; Toronto, Ont.; St. Clair Flats, Michigan; Clear Lake, Iowa; Minneapolis and Fergus Falls, Minn., and Great Whale River, James Bay.

The species also breeds in the Arctic regions of the Old World, and winters south to southern Europe and central Asia.

Aythya affinis (Eyt.) Lesser Scaup Duck.

Breeding Range.—In the case of this species a distinction needs to be drawn between the breeding range and the summer range. Quite a number of nonbreeding individuals spend the summer many miles south of the nesting grounds, so that the eggs or young are the only certain evidence that the species breeds. These nonbreeding birds are not rare on the New England coast, Long Island Sound and the Great Lakes. The lesser scaup does not breed regularly in northeastern United States nor in any of the Maritime Provinces; indeed, there is scarcely a breeding record for the whole of North Amer-

ica east of Hudson Bay and Lake Huron. The extreme easterly points at which the species breeds are around Lake St. Clair and the western end of Lake Erie in Ohio, Michigan and Ontario; thence westward, a few breed in northern Indiana (Kewanna, English Lake), southern Wisconsin (Delavan, Lake Koshkonong), northern Iowa (Spirit Lake, Clear Lake), northern Nebraska (probably in Cherry County), Montana (common) and central British Columbia (Cariboo District.) The species is rather rare on the Pacific coast and seems to have been found only once on the coast of Alaska (Portage Bay, near Chilkat River), though not rare inland on the Yukon River, breeding as far north as Circle City. The principal breeding range of the lesser scaup is the interior of Canada, from northern North Dakota and northern Montana to the edge of the timber near the Arctic coast in the Anderson River and the Mackenzie River regions.

Migration Range.—The route of migration in the fall evidently tends toward the southeast, for at this season the species is not uncommon in New England and is a rare visitant of Nova Scotia and even of Newfoundland and is accidental in Greenland and the Bermudas.

***Aythya collaris* (Donov.)** Ring-necked Duck.

Breeding Range.—The summer home of this species seems to comprise two general areas separated by the Rocky Mountains. The greater number breed in the interior, from North Dakota and Minnesota north to Athabaska Lake and east to the western side of Lake Winnipeg. It breeds rarely south to southern Minnesota (Minneapolis, Heron Lake), northern Iowa (Clear Lake) and to southern Wisconsin (Lake Koshkonong; Pewaukee

Lake.) Though eventually the species may be found breeding in Alberta, at present there seems to be no certain nesting record for the entire Rocky Mountain chain from New Mexico to Alberta. West of the Rockies the ring-necked duck seems to breed in small numbers from Fort Klamath, Ore., to southern British Columbia (Cariboo District.) It is said to breed also on the Near Islands, Alaska.

***Clangula clangula americana* (Bonap.) American Golden-eye.**

Breeding Range.—This is one of the more northern-breeding ducks, but its choice of hollow trees as nesting sites prevents the extension of its breeding range into the treeless Arctic regions, to which it seems well suited by its hardy constitution. It has been noted north to Ungava Bay, Labrador; Fort Churchill, Hudson Bay, and Fort Good Hope, near the mouth of the Mackenzie River. It is probable that the species breeds in the heavy timber nearest to these places. In Alaska it breeds commonly in the interior about as far north as the Arctic Circle, but is very rarely seen on the coast. The species breeds from Newfoundland to British Columbia, north to the Noatak River, but the breeding range extends only a little into the United States, to southern Maine (Calais, Magalloway River), northern New Hampshire (Lake Umbagog), northern Vermont (St. Johnsbury), northern New York (Adirondacks), northern Michigan (Neebish Island, Sault Ste. Marie), North Dakota (Devils Lake), Montana (Flathead Lake) and in British Columbia so close to the southern boundary that the species will probably be found to breed in northern Washington.

A typical form, *Clangula clangula*, breeds in northern Europe and northern Asia, migrating southward to northern Africa and southern Asia.

Charitonetta albeola (Linn.) Buffle-head.

Breeding Range.—In the nesting season the buffle-head is almost wholly confined to Canada, but a few breed in Wisconsin (Pewaukee Lake), northern Iowa (Storm, Clear and Spirit Lakes), Wyoming (Meeteetse Creek), Montana (Milk River, Flathead Lake.) It is a tolerably common breeder in the northern two-thirds of Ontario, and undoubtedly some pairs breed in Quebec and southern Labrador, though it is as yet unrecorded from there, from the Maritime Provinces and from Newfoundland, except as a rather rare visitant. In Manitoba and westward to British Columbia it becomes more common as a breeder and ranges north to Fort Churchill, Fort Rae, the mouth of the Mackenzie and the upper Yukon, rarely to the Yukon mouth. It has been taken as a rare straggler on the west coast of Greenland (Godhaven, October; Frederikshaab), and a few times in Europe.

Erismatura jamaicensis (Gmel.) Ruddy Duck.

Breeding Range.—The principal summer home of the ruddy duck is in the upper Mississippi Valley and the contiguous portions of central Canada; it is rare east of the Alleghenies; breeds regularly from Maine to northern Ungava; rare visitant in Newfoundland; nesting rarely south to Massachusetts (Cape Cod) and probably in Rhode Island (Sakonnet); tolerably common in southern Ontario, Michigan and Wisconsin, and probably breeds casually in Ohio and Illinois. West of the Mississippi it

breeds regularly to southern Minnesota and northwestern Nebraska and rarely in Kansas. The breeding range then dips strongly to the south in the mountains through Colorado to northern New Mexico (La Jara and Stinking Spring Lakes), central Arizona (Stoneman Lake, altitude 6,200 feet), southern California (Los Angeles County) northern Lower California to about latitude 31° and probably northwestern Chihuahua (Pacheco.) The breeding range on the Pacific slope extends north at least to central British Columbia (Cariboo District); in the interior to Great Slave Lake and Hudson Bay (York Factory.) The above is the normal breeding range, but this species has the peculiar habit of establishing colonies far to the southward. Such colonies have been discovered at Santiago, near the southern end of Lower California, in the Valley of Mexico, at the Lake of Duenas, Guatemala, and on the islands of Cuba, Porto Rico and Carriacou. The breeding season of these isolated colonies bears no relation to the usual breeding time in the bird's ordinary range. In northern North Dakota the earliest eggs are deposited the first week in June; Manitoba and Saskatchewan incomplete sets were found the middle of June; the same date—the middle of June—marks the deposition of the eggs in central Colorado. The first half of June may be said to be the usual time for the beginning of nesting. On Cape Cod, Massachusetts, downy young were taken Aug. 17; in northern New Mexico, Sept. 17; in southern Lower California, Nov. 16; at Lake Duenas, Guatemala, in June; while in Cuba and Porto Rico eggs were taken in November, and on Carriacou Island in January.

A PROPOSED LAW FOR BREEDERS

An Act to Encourage the Rapid Increase of Game and Game Fish

SECTION 1. Farmers and other land owners and their lessees who undertake in good faith to increase game or game fish shall be known and designated as game breeders.

SEC. 2. Any game breeder may make application to the State game officer or officers (here insert the title of the Warden or Commission) for a license permitting the applicant to engage in the industry of game or game fish rearing. Such application shall state that the applicant intends in good faith to increase the game or game fish either by hand rearing in captivity or wild in the woods, fields or waters; and shall contain a description by metes and bounds, of the lands or waters to be used for the industry aforesaid. Said State game officer, when it shall appear that such application is made in good faith for the purpose aforesaid shall issue a license permitting said breeder to take his game or fish on the lands or waters during the open season for preserved game and game fish and to sell the same alive for propagation or as food as hereinafter provided.

SEC. 3. The open season for breeders shall be for game from September 1 to March 1 both inclusive: for game fish from April 1 to December 31, both inclusive. Live game may be sold at any time for propagation by breeders to breeders.

SEC. 4. Game and game fish when sold as food shall only be sold to licensed game dealers, who shall be required to give a bond conditioned that they will not purchase or sell any game excepting only game from licensed breeders properly identified as herein provided; and foreign game, which shall be identified in like manner and which may be imported during

the open season for breeders. The State game officer (here insert title) shall issue licenses to dealers authorizing them to sell the game and game fish reared by breeders and game legally imported from foreign countries and other States, upon the payment of the sum of \$50. [This amount might be made smaller for small towns.—EDITOR.]

SEC. 5. All licensed game dealers shall keep a game register and shall enter on the same all game received and sold, stating the kind and amount; from whom purchased, and the date of shipment. Said register shall be open to inspection at all times by the State game officers.

SEC. 6. Breeders who wish to sell game to be used as food shall sell and ship said game only in packages plainly marked with the name of the breeder, the date of sale, and the name of the licensed dealer to whom said game is sold. Said packages shall also contain a label stating the kind and amount of game or game fish contained in the package and a copy of this label shall be forwarded to the State game officer on or before the date of such sale.

SEC. 7. Individuals and common carriers shall not receive or carry any game sold unless the package shall be plainly marked as aforesaid. The penalty for a violation of this section shall be \$100.

SEC. 8. Game dealers shall file an affidavit at the end of the open season for breeders stating that they have not sold any game or game fish contrary to law.

SEC. 9. Any game dealer who shall violate any of the provisions of this act or who shall fail to file the affidavit aforesaid shall forfeit his license and shall also pay a fine of \$1,000.

SEC. 10. Any person who shall enter upon the lands owned or leased by breeders with gun or fishing rod or other device for taking game or game fish shall be fined in the sum of \$25 and shall also pay the breeder \$25 exemplary damages and \$5 for each game mammal, bird or fish taken or destroyed to be recovered in a civil action.

SEC. 11. Game and Fish laws and laws protecting vermin shall not apply to breeders who are engaged in the industry of increasing the game and fish.

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